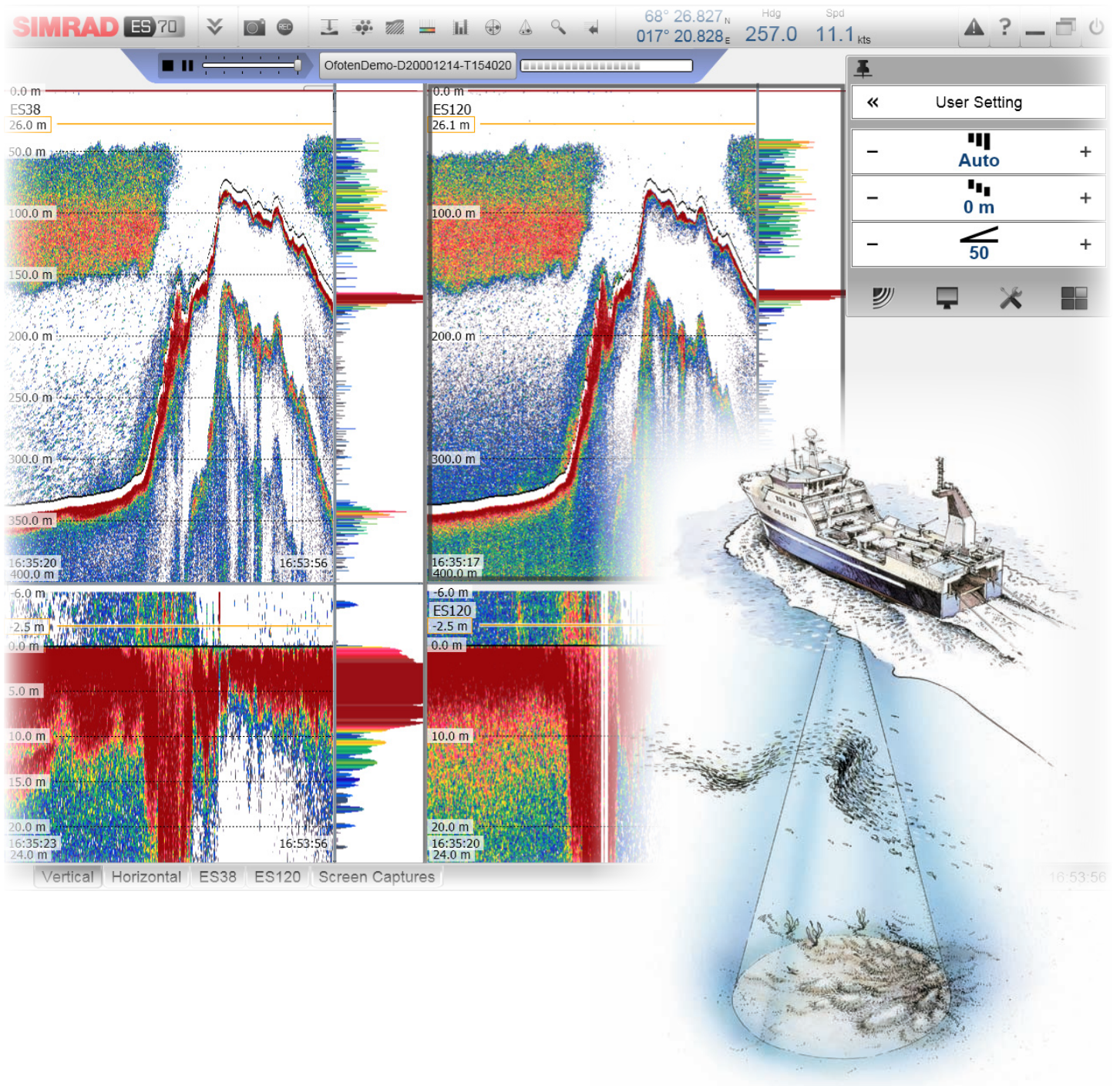


Operator manual

Simrad ES70 Fish finding echo sounder





KONGSBERG

Simrad ES70

Operator manual

Release 1.1.x

This manual provides you with the basic information required to operate the Simrad ES70. For a more detailed description of the operation and functionality, including menus and all parameters, refer to the *Simrad ES70 Reference manual*.

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Revision status

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Rev.B	17.12.2010	Revised for SW version 1.1.x.

License information

When you have obtained the necessary licenses to operate the ES70, we strongly advice that you write down the hardware ID and the license codes on this page.		
Function	Purpose	Code
Hardware ID:	N/A	
License code		
License code		
License code		

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Warning

The equipment to which this manual applies must only be used for the purpose for which it was designed. Improper use or maintenance may cause damage to the equipment and/or injury to personnel. The user must be familiar with the contents of the appropriate manuals before attempting to install, operate or work on the equipment.

Kongsberg Maritime AS disclaims any responsibility for damage or injury caused by improper installation, use or maintenance of the equipment.

Support information

If you require maintenance or repair, contact your local dealer. You can also contact us using the following address: simrad.support@simrad.com. If you need information about our other products, visit <http://www.simrad.com>. On this website you will also find a list of our dealers and distributors.

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About this manual

Purpose

The purpose of this operator manual is to present the descriptions and procedures required to operate the Simrad ES70 in a safe and efficient manner.

It is not within the tasks of this manual to describe all functions and parameters in detail. It is therefore also important that you study the other documents that are provided with your system. For detailed descriptions of all functions and parameters, refer to the *Simrad ES70 Reference manual*.

Get to know your echo sounder!

Your Simrad ES70 echo sounder is an advance and accurate instrument developed to help you find fish. It is still easy to use as soon as you have familiarized yourself with the menu system and the way you change parameters.

The ES70 comprises the following main parts:

- A colour display
- A computer
- One or more transceiver units
- One or more transducers

This manual will focus on the operational procedures and some theory. For additional details, see the *Simrad ES70 Reference manual* and the context sensitive on-line help.

Click “Help”!

Installed on your Simrad ES70 you will find a comprehensive on-line help system. You may not find it in your language, but everything you can read in the *Simrad ES70 Reference manual* can also be found in the context sensitive on-line help.

To access this information click [?] on the **Title Bar** menu, or the [?] button in one of the dialogs.

Note that when you open the help system it will place itself on the top of the display presentation!

References

The following user manuals have been provided for the Simrad ES70. All manuals may be downloaded from <http://www.simrad.com>.

- **English:**
 - Simrad ES70 Quick start guide [354205]
 - Simrad ES70 Operator manual [343539]
 - Simrad ES70 Reference manual [338106]
 - Simrad ES70 Installation manual [343522]
- **Español:**
 - Simrad ES70 Guía rápida de inicio [354319]
 - Simrad ES70 Manual de Usuario [351291]
 - Simrad ES70 Manual de Referencia [347237]
- **Norsk:**
 - Simrad ES70 Oppstartsguide [353233]
 - Simrad ES70 Operatørmannal [353233]

Simrad ES70

Study this chapter to familiarize yourself with the Simrad ES70.

Topics

- *Important* on page 9
- *System description* on page 10
- *System diagram* on page 11
- *System units* on page 12
- *Support information* on page 14

Important

As with all other advanced instruments, there are a few important things that you must be aware of.

When the ES70 is not used

When you do not use the ES70, switch off the display and the computer.

You may switch off the transceiver too.

When docking your vessel

It is very important that no one tries to use the ES70 when the vessel is in dry dock.

If the transducer is activated when out of water it may be damaged beyond repair. To ensure that this can not happen, remove the power supply to either the computer or the transceiver - or both! You may also remove the circuit breakers on the AC mains supply to the ES70 transceiver.

Do this before the vessel is placed in the dry dock!

If something breaks down

If you believe that something has broken down, contact your local dealer. He will be able to assist.

A list of all our dealers is provided on <http://www.simrad.com>. If you are unable to contact a dealer, observe the support information in this chapter.

→ *Support information* on page 14

When you switch off the ES70

You must NEVER switch off the ES70 by means of the on/off switch on the computer.

You must ALWAYS exit the ES70 application by clicking the **Exit** button on the **Title Bar**.

If you power down the ES70 by means of the computer switch you may damage the software application and the interface parameters to external devices.

System description

The Simrad ES70 is designed for the professional fishery community implementing the latest innovations. Echo sounders ranging from relatively low-cost single beam to large multi-frequency systems containing several split-beam channels can be realised.

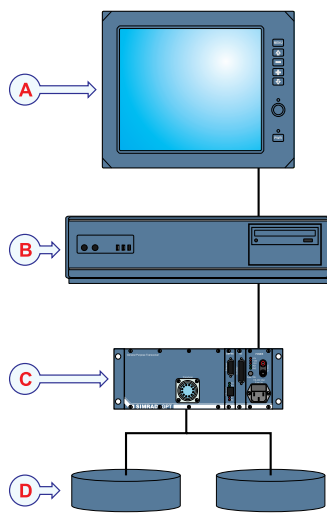
The Simrad ES70 comprises the following units:

- Colour display
- Processor Unit (The ES70 Marine Computer may be provided)
- One or more General Purpose Transceiver (GPT) units
- One or more standard single beam transducers
- One or more split-beam transducers

System diagram

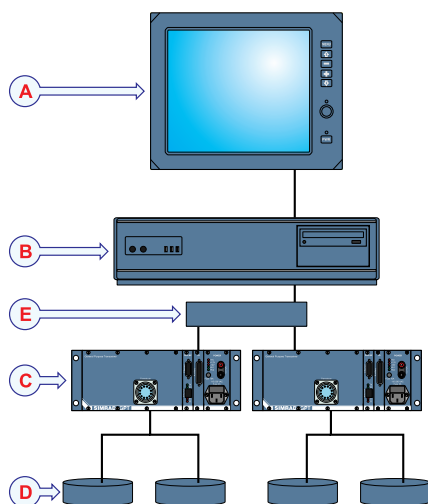
Two basic system diagrams are provided. Interface capabilities and power cables are not shown.

Figure 1 System diagram with a single General Purpose Transceiver (GPT)



- A** Display Unit
- B** Processor Unit
- C** General Purpose Transceiver (GPT)
- D** Transducer

Figure 2 System diagram with two General Purpose Transceivers (GPT)



- A** Display Unit
- B** Processor Unit
- C** General Purpose Transceiver (GPT)
- D** Transducer
- E** Ethernet switch

(CD024216-002)

System units

Each system unit is described in more detail.

Colour display

Any commercial colour display can be used with the Simrad ES70 system provided that the display meets the basic specifications.

These specifications are:

- **Minimum screen resolution:** 1280 x 1024

Processor Unit

A dedicated maritime computer may be provided with the Simrad ES70 system.

Figure 3 ES70 Marine Computer



When this computer is supplied, it is readily set up with all necessary software. The computer is customized by Simrad to contain no moving parts.

The computer is normally mounted in the wheelhouse. If you wish to take advantage of the audible alarms offered, the computer must be installed in such manner that the built-in loudspeaker can be heard. As an alternative, an external powered loudspeaker can be connected.

Note

The ES70 Marine Computer does not contain any fans. It will be very warm, even during normal operation.

Any commercial computer can also be used with the Simrad system provided that the computer meets the basic minimum specifications.

Minimum computer requirements

Observe the following minimum computer requirements.

- **Operating system:** Microsoft® Windows® XP® (32-bit) or Microsoft® Windows® 7 (32-bit) ^[1]

On new installations, we recommend that Microsoft® Windows® 7 is used.

- **Processor speed:** 2 GHz Dual core

1. The ES70 software does not support Microsoft© Windows© NT or older operating systems.

- **Memory:** 2 Gb
- **Free hard disk space:** 30 Gb
- **Graphic adapter:** DirectX9.0c compatible with Direct3d and OpenGL^[2]
- **Interfaces:**
 - One Ethernet interface to communicate with the transceiver
Note that “PCI Express” serial interface boards are not supported.
 - One Ethernet interface to communicate with ship’s local area network (if required)
 - One or more serial line interfaces (depends on how many interfaces that are required for the specific integration)
- **Display resolution:** 1280 x 1024^[3]

General Purpose Transceiver (GPT)

The General Purpose Transceiver (GPT) contains transmitter and receiver electronics. The receivers are designed for low noise, and they can handle input signals spanning a very large instantaneous dynamic amplitude range. All targets are correctly measured and displayed.

A twisted pair Ethernet cable connects the General Purpose Transceiver (GPT) to the Processor Unit. The distance between the Processor Unit and the transceiver can be extended up to maximum 70 meters. If a longer cable is required, cut it in half, and insert an Ethernet switch half way to provide buffer amplification.

If more than one transceiver is used, a small Ethernet switch is required to connect the General Purpose Transceivers to the Processor Unit.

Figure 4 General Purpose Transceiver (GPT)



External power supply

In order to avoid electrical noise, certain GPT configurations are supplied with an external power supply. This supply is mounted by means of two brackets.

Single beam transducers

The ES70 must be connected to one or more transducers.

A wide range of operational frequencies are available.

For more information about the single beam transducers provided by Simrad, consult www.simrad.com.

-
2. A large number of commercial graphic adapters are available, and Simrad has not tested all of them. Even adapters meeting the minimum specifications may in some cases prove to fail with the ES70 software. We welcome any feedback with comments or experiences with graphic adapters.
 3. This is the minimum resolution. As with all other Windows applications, the ES70 software will work with higher resolutions, provided that it is supported by the graphic adapter in the computer and the display connected.

Split-beam transducers

The ES70 can be used with Simrad's advanced split-beam transducers. These transducers are available at frequencies ranging from 18 to 200 kHz.

For more information about the split-beam transducers provided by Simrad, consult www.simrad.com.

Support information

If you need additional technical support for your Simrad ES70 you must contact your local dealer, or one of our support departments.

Norway (Main office)

- **Address:** Strandpromenaden 50, 3190 Horten, Norway
- **Telephone:** +47 33 03 40 00
- **Telefax:** +47 33 04 29 87
- **E-mail address:** simrad.support@simrad.com
- **Website:** <http://www.simrad.no>

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- **Website:** <http://www.simrad.com>

Installation

These are the specific procedures required to get you started. Normally, you will only need to do these procedures once.

We recommend that you allow your dealer – with the assistance from a shipyard – to do the physical installation, install the software, obtain a valid license, and get you started.

Topics

- *Basic system installation* on page 15
- *Software installation* on page 16
- *Software license* on page 16
- *Initial start-up procedure* on page 17

Basic system installation

This procedure explains the basic principles of ES70 installation. It does not provide any details related to physical installation of the various units, location and installation of the transducer(s), and the various interface parameters.

Note

In order to install the Simrad ES70 you must refer to the Simrad ES70 Installation manual.

- 1 Install the various hardware units (transceiver(s), computer(s) and transducer(s) as described in the *Simrad ES70 Installation manual*.
- 2 Connect all necessary cables between the hardware units.
 - a Connect the transducer(s) to the transceiver(s).
 - b Connect power to the transceiver(s).
 - c Connect the Ethernet cable between the transceiver and the computer. Use an Ethernet switch if you have more than one transceiver.
 - d Connect the necessary cables to the display, power and video.These tasks are described in detail in the *Simrad ES70 Installation manual*.
- 3 Do a close visual inspection of the installation. Check each cable and connection to ensure that all wiring is correct.

- 4 Power up the transceiver(s) and the computer, and proceed with the next procedure.
→ *Software installation* on page 16

Software installation

Use this procedure when you wish to install the ES70 software on a computer.

Note that minimum hardware and software requirements must be met by the computer.

- 1 Power up the computer.
- 2 Insert the ES70 CD-ROM.

If your computer is not fitted with a CD or DVD drive, copy the files from the CD to a USB memory stick.
- 3 Observe that the installation program opens.

If the installation program does not start automatically, use a file manager to access the CD or USB memory stick. Double-click on the **Setup.exe** file to start the installation.
- 4 Allow the installation program to run. Follow the instructions provided.
- 5 Once the installation has been completed, double-click the program icon on the desktop to start the application.
- 6 If you use **Windows 7** operating system:
 - a Observe that **Windows 7 Firewall** will open a dialog requesting information about the network.

Select *Public*, and click **Allow access**.
 - b The operating system may also open other dialogs to verify that the ES70 software can run on the computer. You must permit this.
- 7 Observe the relevant start-up procedure.

The initial start-up procedure is provided in chapter *Installation*. A standard procedure for power on is located in chapter *Getting started*.
→ *Initial start-up procedure* on page 17
→ *Power on* on page 20

Software license

The ES70 requires a valid license to operate.

Without a license you will not be able to communicate with the transceiver.

Note

If you replace your computer, or if you replace major components inside your computer, you will need a new license code.

We strongly advice you to record the license code for safe keeping. You may for example write it down in the beginning of this manual.

- 1 Double-click the ES70 icon on the desktop to start the application.
- 2 Click the **Setup** icon under the **Main** menu to open the **Setup** menu.



→ *Setup menu* on page 106

- 3 Click **Installation** to open the **Installation** sub-menu.



On the sub-menu, click **Software License** to open the **Software License** dialog.



- 4 Write down the **Hardware ID** provided by the **Software License** dialog.
- 5 Contact your dealer to order the software license.
Your dealer will need the following information from you to place the order:
 - Vessel name and call sign
 - Vessel type (trawler, purse seiner, etc.)
 - Vessel owner's name, address and contact information
 - Serial number on all transceivers
 - Hardware ID
- 6 When the software license is returned to you, start the ES70, open the **Software License** dialog, and click **Enter Licence String**.
- 7 Write down the code, and click **Ok**.
- 8 Click **OK** to save the current settings and close the dialog.

Initial start-up procedure

This procedure explains how to set up you computer to communicate with the transceiver. You only need to do this once.

Note that this procedure cover both the Windows XP and Windows 7 operating systems.

- 1 On the computer, define the network adapter settings

Windows XP

- a Click **Start** → **Settings** → **Network Connections**.
- b Click on the network adapter once to select it.
- c Right-click, and click **Properties** on the short-cut menu.
- d On the list of connections, click **Internet Protocol (TCP/IP)**, and then **Properties**.
- e Click **Use the following IP address**, and enter the IP address and network mask.
IP Address: 157.237.14.12
Subnet mask: 255.255.0.0
- f Click **OK** to save the settings.
- g Exit all dialogs.

Windows 7

- a Click **Start** → **Control Panel** → **Network Connections**.
 - b Click **Change adapter settings** on the left menu.
 - c Click once on the network adapter to select it, and click **Properties** on the short-cut menu.
 - d On the list of connections, click **Internet Protocol 4 (TCP/IPv4)**, and then **Properties**.
 - e Click **Use the following IP address**, and enter the IP address and network mask.
IP Address: 157.237.14.12
Subnet mask: 255.255.0.0
 - f Click **OK** to save the settings.
 - g Exit all dialogs.
- 2 On the computer, start the ES70 program.
 - 3 Set up the transceiver(s) and transducer(s).

Each transceiver contains one or more frequency channels.

This phrase is used to identify the combination of a transceiver, transducers and the frequencies offered. Split beam transceivers contain only one channel each.

The upper part of the **Transceiver Installation** dialog displays a list of frequency channels which either are, or have been, installed on the ES70. For each channel, a **Status** label is provided.

The following **Status** values are available:

- **Busy:** The frequency channel is already in use, probably by another echo sounder on the same network. You can not connect to this channel.
- **Installed:** This frequency channel is connected to you ES70 system.
- **Lost:** This frequency channel can not be used.
- **Available:** This frequency channel is vacant and ready for use.

This procedure explains how to install a frequency channel.

- a** Click the **Setup** icon under the **Main** menu to open the **Setup** menu.



→ *Setup menu* on page 106

- b** Click **Installation** to open the **Installation** sub-menu.



On the sub-menu, click **Transceiver Installation** to open the **Transceiver Installation** dialog.



This dialog is used to control the communication between the ES70 computer and the transceiver(s) and transducer(s).

- c** In the **Transceiver Installation** dialog, click **Browse**.

The ES70 will automatically search the network for transceivers.

- d** Observe that all the frequency channels are listed in the dialog.

- e** Select a frequency channel that is available, and choose the correct transducer in the spin box.

Note

This is a critical task. You must ensure that the correct transducer is selected. If you connect the transceiver to a transducer that can not handle the power rating, it may be damaged beyond repair.

- f** Observe that the status for the relevant frequency channels changes to *Installed*.

- g** Click **OK** to save the current settings and close the dialog.

4 Start normal operation.

This procedure explains how to set up the ES70 for normal operation.

- a** Observe the **Main** menu. It is normally located on the right hand side of the ES70 presentation.

- b** Click the **Operation** icon under the **Main** menu to open the **Operation** sub-menu.



→ *Operation menu* on page 104

- c** Click the **Operation** button, and select *Normal*.

Getting started

This chapter describes how to get started with the basic operation of the ES70.

This chapter assumes that the ES70 Fish finding echo sounder has at least one frequency channel (transceiver and transducer) readily connected. If this is not the case, observe the dedicated procedure.

The procedure is located in the *Simrad ES70 Reference manual*.

Topics

- *Power On/Off procedures* on page 20
- *Using the trackball* on page 22
- *Starting normal operation* on page 23
- *Echo sounder presentations* on page 33
- *Title Bar* on page 35
- *Taskbar* on page 36
- *The menu system* on page 37

Power On/Off procedures

Observe these procedures to switch the Simrad ES70 on and off.

Note

Before you power up the ES70 for the very first time, observe the procedures in chapter Installation on page 15.

Make sure that you have sufficient water below the hull before you power up the ES70 . If you start the ES70 with the transducer in air, you may damage it beyond repair!

Power on

This procedure explains how to power up the Simrad ES70.

- 1 Power up the General Purpose Transceiver (GPT) unit.
(This unit is normally always powered up.)

- 2 Power up the ES70 computer and the display.

Wait for the computer to start up.

- 3 Double-click the ES70 icon on the desktop to start the program.

- 4 Wait while the ES70 program starts on the computer.

When the ES70 program has started, the icon for the **Operation** menu will flash to remind you that “pinging” is disabled. This is for safety reasons. You must manually start “pinging” by means of the **Ping** button.

- 5 Choose user settings.

During the program initialisation, a dialog appears to let you choose from the current user settings available on the ES70.

The dialog is only visible a few seconds. You do not need to make a choice here. You can select user setting at any time by means of the **User Settings** dialog on the **Main** menu.

- 6 Choose operational mode.

This procedure explains how to set up the ES70 for normal operation.

- a Observe the **Main** menu. It is normally located on the right hand side of the ES70 presentation.

- b Click the **Operation** icon under the **Main** menu to open the **Operation** sub-menu.



→ *Operation menu* on page 104

- c Click the **Operation** button, and select *Normal*.

- 7 On the **Ping** button, click the symbol on the right hand side to start ping.



- 8 Observe that the ES70 starts.

The ES70 starts up using the same operational parameters as the last time you used it. If these parameters are acceptable, continue operation. If you wish to alter basic operational parameters, see the dedicated procedures.

→ *Starting normal operation* on page 23

When the ES70 starts, it is very important that it detects the bottom correctly. In most cases this will take place automatically. However, we have experienced that large schools of fish or difficult bottom conditions have deceived the ES70 to display the wrong depth. In these cases the sounder may display the bottom at 0,0 meters. In order to aid the ES70 to locate the correct depth, observe the dedicated procedure.

→ *How to check the bottom detector settings* on page 25

Power off

This procedure explains how to power off the Simrad ES70.

Note

You must never switch off the ES70 only by means of the on/off switch on the computer. This may damage the software or the interface parameters for external devices. You must ALWAYS use this procedure.

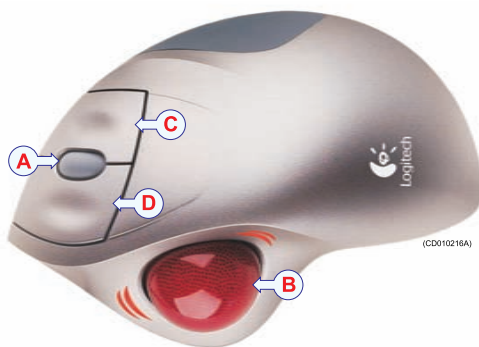
- 1 Click the **Exit** button on the **Title Bar** in the top right corner of the ES70 presentation.



- 2 Observe that the ES70 application closes down.
- 3 If the computer does not switch itself off automatically, use the functionality provided by the operating system to switch it off manually.
- 4 Switch off the display.
- 5 Switch off the transceiver(s).

Using the trackball

Figure 5 Typical trackball



All ES70 functions are controlled with the trackball. The ball controls the movements of the cursor, and the buttons are used to click on buttons and select parameters.

- A** Control wheel
- B** Trackball
- C** Right mouse button
- D** Left mouse button

This trackball is connected to the computer, and by means of the buttons and the wheel you can control all the dialogs and parameter

settings.

A standard computer mouse can also be used. If you wish to use a mouse, we recommend that you find one equipped with a control wheel.

Starting normal operation

Once you have powered up the complete ES70 system, you are ready to start the actual operation. When started up, the ES70 will automatically apply its previous setup parameters.

These procedures are partly provided to get you acquainted with the basic functionality provided by the ES70, and partly to set up the system for normal use. If you already know the ES70, or the current parameters are acceptable, you do not need to carry out the procedures.

The procedures assume that the ES70 has at least one frequency channel (transceiver and transducer) readily connected. If this is not the case, observe the relevant installation procedure.

The relevant procedure is located in the *Simrad ES70 Reference manual*.

Topics

- *How to select menu language on page 23*
- *How to choose operational mode on page 24*
- *How to check the transceiver and transducer settings on page 24*
- *How to check the bottom detector settings on page 25*
- *How to check the colour scale settings on page 26*
- *How to check the size distribution and fish position settings on page 27*
- *How to check the echogram settings on page 28*
- *How to check the range settings on page 30*
- *How to save the current user settings on page 32*

How to select menu language

The menu buttons – as well as other text – in the ES70 presentation are available in several languages.



- 1 Observe the **Main** menu. It is normally located on the right hand side of the ES70 presentation.
- 2 Click the **Display** icon under the **Main** menu to open the **Display** menu.



→ *Display menu on page 105*

- 3 Click the middle of the **Language** button to open the list of available languages.
You can also click the [+] and [-] characters on the button to leaf through the list of available languages.
- 4 Click once on the language you wish to use.

- 5 Observe that the sub-menu is closed, and that all text in the menu buttons change to the selected language.

The context sensitive on-line help file may also be available in your language. To change the language in the on-line help, restart the ES70. If your language is *not* offered, the English on-line help will appear.

How to choose operational mode

This procedure explains how to set up the ES70 for normal operation.

- 1 Observe the **Main** menu. It is normally located on the right hand side of the ES70 presentation.
- 2 Click the **Operation** icon under the **Main** menu to open the **Operation** sub-menu.



→ *Operation menu* on page 104

- 3 Click the **Operation** button, and select *Normal*.

How to check the transceiver and transducer settings

This procedure explains how you can verify that the transceiver and transducer settings are correct.

- 1 Observe that the currently connected transducer(s) are shown as tabs on the **Taskbar**. Each transducer name also identifies the operational frequency.
- 2 Click the **Setup** icon under the **Main** menu to open the **Setup** menu.



→ *Setup menu* on page 106

- 3 Click **Installation** to open the **Installation** sub-menu.



On the sub-menu, click **Transceiver Installation** to open the **Transceiver Installation** dialog.



This dialog is used to control the communication between the ES70 computer and the transceiver(s) and transducer(s).

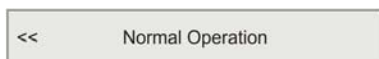
- 4 Check that all applicable transceivers and transducers are connected and operational. For each transceiver, this is indicated by the green label with text “Installed”. If a problem exists, refer to the relevant procedure in the *Operational procedures* chapter.

- 5 Click **OK** to save the current settings and close the dialog.
- 6 Click the **Operation** icon under the **Main** menu to open the **Operation** sub-menu.



→ *Operation menu* on page 104

- 7 Click **Normal Operation** to open the **Normal Operation** dialog.



This dialog is used to define various parameters associated with the transceiver. These settings include transceiver mode, the depth of the transducer surface, the transmit power, and the pulse duration. Note that this dialog is not available in *Replay* mode.

- 8 For each channel (transceiver/transducer combination):

- a Set **Mode** to *Active*.

- b Set **Pulse Length** to *Auto*.

The ES70 will automatically choose the best pulse duration to fit the operational frequency, mode and current depth. The pulse duration defines the resolution.

→ *About pulse duration* on page 113

- c Set **Power** to maximum.

- d Check that the **Depth** value is set correctly.

This is the depth of the transducer face relative to the water surface. A positive value of for example 5 meters means that the transducer is located 5 meters below the sea surface. For accurate depth readings, this **Depth** value must be set up correctly.

- 9 Click **OK** to save the current settings and close the dialog.

How to check the bottom detector settings

This procedure explains how to set up the bottom detector parameters (minimum and maximum depth) using the **Bottom Detector** dialog. Use these parameters if the ES70 has problems detecting the bottom.

The purpose of the **Bottom Detector** dialog is used to define the upper and lower depth limits most likely to be used during the ES70 operation. In this dialog, you can also modify the setting for **Bottom Backstep** to change the bottom detection relative to the bottom echo.

- 1 Click the **Active** icon under the **Main** menu to open the **Active** menu.



→ *Active menu* on page 107

- 2 On the **Active** menu, click **Bottom Detector** to open the **Bottom Detector** dialog.



This dialog is used to define various parameters associated with the bottom detection. These include the depth range, where the ES70 searches for the bottom.

- 3 Set **Minimum Depth** and **Maximum Depth** to values fit for the depth at your current location.

Note

If you set maximum depth to a value identical or smaller than the minimum value, the bottom detection algorithm will be disabled. The ES70 will then not be able to detect the bottom at all, and the displayed depth will be 0.00m

- 4 Click **OK** to save the current settings and close the dialog.

How to check the colour scale settings

This procedure explains how you can change the colour scale currently used for the ES70 presentation.

- 1 Click the **Colour Scale** icon on the **Title Bar** to open the **Colour Scale** information pane.



→ *Colour Scale information pane* on page 60

- 2 Observe that the current colour scale is shown.



By default you have 64 or 12 colours available to present the echograms, and a selection of palettes. The colour scale can be retrieved any time by clicking the **Colour Scale** icon on the **Title Bar**.

Which colour scale to use is defined in the **Colour Setup** dialog on the **Display** sub-menu.

You can filter out the weakest echoes by manually modifying the colour threshold.

- a Click the **Colour Scale** icon on the **Title Bar** to open the **Colour Scale** information pane.
- b Move the cursor to the left side of the colour scale.
Observe that the cursor changes shape to a dual arrow line.
- c Click on the left edge of the colour scale, keep the mouse button depressed, and drag the edge towards right.
- d Observe that the weakest colours are removed from the colour scale, and thus also the weakest echoes from the echogram presentation.
- e Release the mouse button.

- f** In order to restore the weakest colours, click on the left edge of the current colour scale, and drag towards left.
- 3** Click the **Display** icon under the **Main** menu to open the **Display** menu.



→ *Display menu* on page 105

- 4** On the **Display** menu, click **Colour Setup** to open the **Colour Setup** dialog.



This dialog is used to define which colour scale to use on the ES70 presentations. You can test the options by making a selection, and clicking **Apply**. The resulting colour scale is immediately shown in the **Colour Scale** information pane.

When the colour scale uses 12 colours, each colour always represents a 3 dB value range. Using 12 colours thus enables mapping of a 36 dB value range to colours.

- 5** Click **OK** to save the current settings and close the dialog.

How to check the size distribution and fish position settings

This procedure explains how to verify the current parameters for size distribution and fish size settings.

Note

Size distribution and fish position information panes are only available if you use a split beam echo sounder system!

- 1** Click the **Size Distribution** icon on the **Title Bar** to open the **Size Distribution** information pane.



The **Size Distribution** information pane shows a histogram of the single fish echoes detected. The calculation is based on the parameters you have selected in the **Calculation Interval** dialog; time, ping or a chosen part of the current view. It thus provides a visual indication on how large the fishes are within the chosen interval.

Only the fishes detected by the current transducer frequency are shown.

The large number above the histogram shows the average size of all the fishes in the histogram. The value is presented in the unit you have chosen in the **Units** dialog. For an accurate x-axis value, place the cursor on a vertical bar in the histogram, and read the value from the label.

The abbreviation TS is commonly used. It means “Target Strength”, and this is a measure of how strong echo the individual fishes in the current echogram generate. The echo strength indicates the size of the fishes. The **Size Distribution** information pane thus provides a mathematical estimate of the sizes of all the chosen fish species in the echogram.

The target strength from a fish varies from specie to specie. To change the fish species, use the **Fish Select** dialog opened on the **Setup** menu.

→ *Size Distribution information pane* on page 62

- 2 In the **Size Distribution** information pane, click the **Setup** icon in the top right corner to open the **Size Distribution** dialog.

The **Size Distribution** dialog allows you to shape the histogram in the **Size Distribution** information panel to your own requirements. You can set up the mode, the upper and lower limits, the accuracy, and the vertical resolution.

- 3 Click **OK** to save the current settings and close the dialog.
- 4 Click the **Fish Position** icon on the **Title Bar** to open the **Fish Position** information pane.



The **Fish Position** information pane shows the position within the beam of the detected single echoes for the current ping (largest circles) and the three previous ping (smaller circles). The view is “from above”. The colours indicate the echo strength.

→ *Fish Position information pane* on page 64

- 5 Click the **Echo Position** icon on the **Title Bar** to open the **Echo Position** information pane.



The **Echo Position** pane shows the position within the beam of the detected single echoes for the current ping (largest circles) and the three previous ping (smaller circles). The colours indicate the echo strength. This is basically the same view as the **Fish Position**, however the echoes are here viewed from the side and not from above.

→ *Echo Position information pane* on page 65

How to check the echogram settings

This procedure explains how you can control the echogram views, select an echogram to make it “active”, and check and - if necessary - change the parameter settings for the echogram.

- 1 Observe the ES70 echogram.

If you have two or more channels (transducers/frequencies), observe the tabs on the **Taskbar**.

→ *Display organisation* on page 41

→ *Taskbar* on page 67

- 2 Click one of the transducer tabs. Observe that only the echogram from the selected frequency channel is shown.

By default, two echograms are shown for each frequency channel. The top echogram is surface related, while the bottom echogram is bottom related. Several echogram types are provided.

a Surface

The echogram is related to the sea surface. Start depth (upper echogram boundary) and vertical range (across echogram) are manually selected by the **Start Depth** and **Range** buttons on the **Main** menu.

The biomass is automatically calculated based on choices you make in the **Calculation Interval** dialog; within a given time frame, a defined number of pings, or a portion of the echogram view. The data is then taken from an echo area starting immediately after the transmit pulse, and ending just over the detected depth. If you have limited your vertical range (using the **Range** and **Start Range** settings), the resulting area is used for the biomass calculation. If the seabed is clearly defined with a unique bottom detection, the bottom echo will not be included in the calculations. Therefore, if you switch the bottom detector off, the bottom echo will be included in the calculation.

→ *Biomass information pane* on page 59

b Bottom

The echogram is related to the detected bottom. Stop depth (lower echogram boundary) and vertical range are manually selected by the **Start Depth** and **Range** buttons on the **Main** menu. The echogram is only drawn for pings having a successful bottom detection.

The biomass calculation is made in the same way as for **Surface** echograms.

c Pelagic

This echogram is nearly identical to the **Surface** echogram. However, the biomass is calculated in a different manner.

The biomass calculations are not restricted by the bottom detection. This means that the bottom echo will be included in calculations if it appears within the chosen range.

Example 1 Biomass calculation

If you are investigating a large school of pelagic fish, set the **Start Range** and **Range** to enclose the school. If the school is large enough, a **Surface** echogram may mistake it for bottom, and the biomass readings will be wrong. The **Pelagic** echogram will however disregard the bottom detection, and give a correct estimate of the biomass.

d Trawl

This echogram covers the vertical opening of the trawl.

The echogram is only drawn when trawl position information is available.

The biomass calculation is made in the same way as for **Surface** echograms.

3 Move the cursor over the echogram.

Observe that a rectangular “tooltip” label is shown. It provides information about the echoes at the cursor’s present position. Which information to include in the label is defined in the **Display Options** dialog.

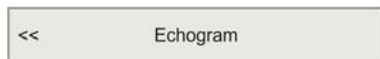
4 Click the **Horizontal tab. Observe that the echogram channels are shown horizontally.**

5 Click the **Vertical** tab. Observe that the echogram channels are shown vertically.

6 Click on one of the echograms.

Observe that the echogram then appears with a thick border line. The echogram you have selected is now the “active” echogram. Any changes made in the **Echogram** dialog will by default only apply to this echogram.

7 On the **Active** menu, click **Echogram**.



Observe that the **Echogram** dialog opens. This dialog is used to control the appearance of the active echogram.

8 In the **Echogram** dialog, check that the **Lines** tab is shown.

The **Lines** tab in the **Echogram** dialog allows you to change the appearance of the bottom line. You can add an extra bottom line, and in addition to this you can enable either a white line or a hardness indicator line. The tab offers several horizontal information lines, and you can choose the vertical scale of the echogram. Finally, the **Lines** tab offers time or distance markers, and you can enable annotations.

9 Click **Bottom line** and **White line** to enable these. Observe the changes on the echogram.

10 Click the **Echogram** tab.

The **Echogram** tab in the **Echogram** dialog allows you to select which TVG curve to use for the echogram. You can choose from several standard curves, or make your own. The tab also allows you to choose which type of echogram you wish to display.

→ *About TVG gain* on page 109

11 Change the **Echogram Type** to see the variations.

12 Click the **Horizontal Axis** tab.

13 Try the various options to see the variations on the echogram.

14 Click **OK** to save the current settings and close the dialog.

How to check the range settings

This procedure describes how to check and adjust the vertical range settings.

1 Observe the vertical range of the echograms.

Note that the vertical range is set up differently depending on the echogram type.

2 Click in a surface related echogram to make it “active”.

- 3 Observe the **Range** button on the **Main** menu.



The **Range** function allows you to specify the vertical range of the water column covered by the echogram. The range is defined from a selected start range, and down to a value beneath the current bottom depth. The value shown and selected is by default applied only to the currently selected echogram.

- 4 Observe the **Start Range** button on the **Main** menu.



The **Start Range** function allows you to specify the start depth of the echogram, that is from which depth in the water column the presentation shall start. The value shown and selected is applied to the currently selected echogram type. In a surface related echogram, you can click **Automatic Start Depth** to allow the ES70 to select the start range automatically.

Example 2 Start Range in a surface related echogram

In a surface echogram, set the **Start Range** value to 0 meters. This will make the echogram start from the sea surface (provided that the transducer offset has been defined). Set **Range** to the current depth plus 20 meters. The echogram will now show the area from the sea surface and down to 20 meters “below” the bottom. The bottom contour is easily detected when the depth changes.

Example 3 Start Range in a surface echogram

In a surface echogram, set the **Start Range** value to 10 meters. This will make the echogram start from 10 meters below the sea surface (provided that the transducer offset has been defined). Set **Range** to the current depth plus 20 meters. The echogram will now show the area from 10 meters below the sea surface, and down to 10 meters “below” the bottom. The bottom contour is easily detected when the depth changes.

- 5 Set **Range** to *Auto*, and set **Start Range** to 0.
- Observe the changes made to the surface related echogram.
- 6 Click in a bottom related echogram to make it “active”.
- 7 Observe the **Range** and **Start Range** buttons on the **Main** menu.

Example 4 Start Range and Range in bottom related echogram

In a bottom echogram, set the **Start Range** value to –5 meters. This will make the echogram start from 5 meters above the bottom. Set **Range** to the 5 meters plus 10 = 15 meters. The echogram will now show the area from 5 meters above the depth, and down to 10 meters “below” the bottom. The bottom contour will appear as a flat line.

- 8 Set **Range** to *15*, and set **Start Range** to *5*.

Observe the changes made to the bottom related echogram.

How to save the current user settings

This procedure explains how to save the current configuration and parameter settings.

If you have several users with favourite configurations, if you work with different gears, or with different hardware configurations, depth or bottom conditions, we recommend that you save the ES70 operational parameters for future use.

- 1 Observe the **Main** menu. It is normally located on the right hand side of the ES70 presentation.
- 2 Click the **User Settings** button to open the **User Settings** dialog.



- 3 In the **User Setting** dialog, click the **Save Current Setting** button.
- 4 In the **Setting** dialog, click **OK** to accept the suggested name.
- 5 You can also choose a different name.

If you have a keyboard connected to the ES70 computer, you can click in the text field, remove the suggestion, and enter any name.

If you do not have a computer keyboard connected to your ES70 system, click the **Keyboard** button to open an on-screen keyboard.

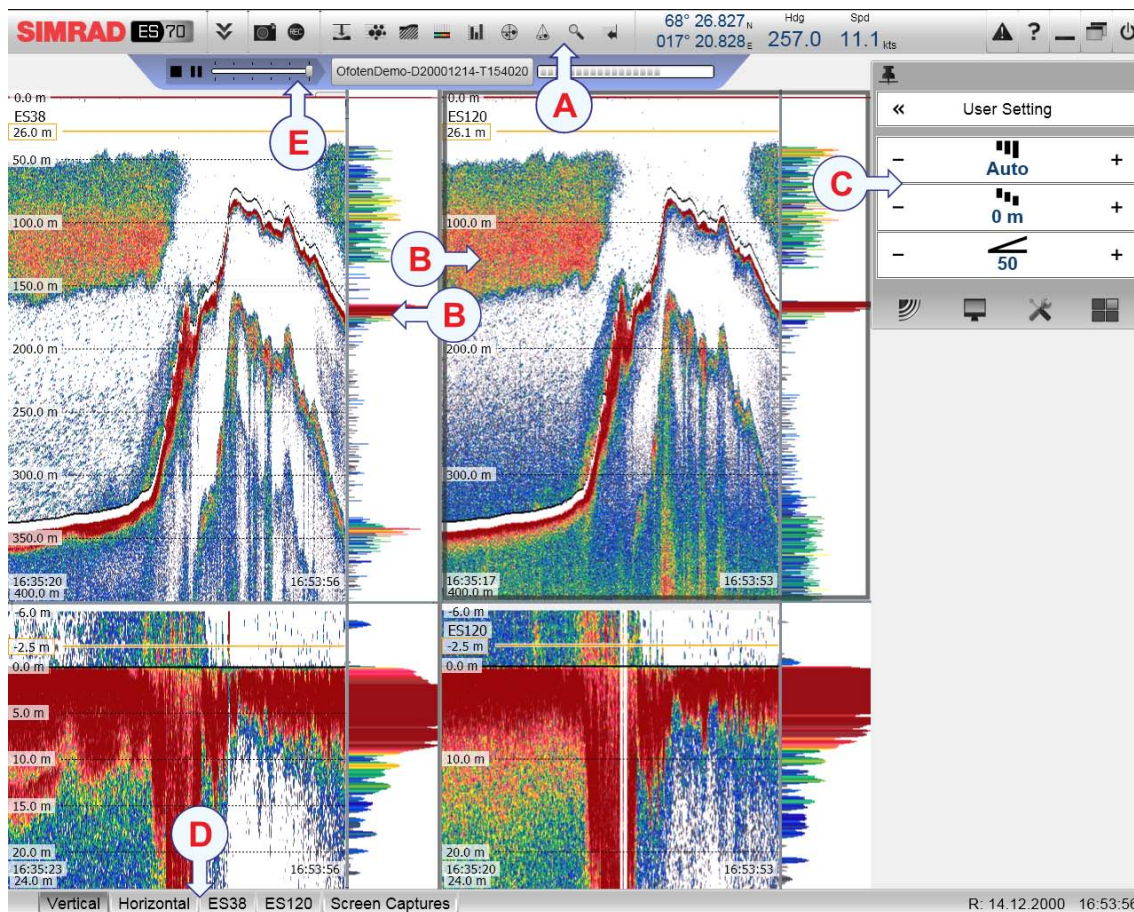
Click **OK** to save the settings with the chosen name.

- 6 Observe that the name you have chosen appears on the **Saved Settings** list.
- 7 Click **OK** to save the current settings and close the dialog.

Echo sounder presentations

This section describes the overall layout of the presentation provided by the ES70.

Figure 6 Echo sounder presentation (example)



The example shows a dual frequency echo sounder using two split-beam transducers (38 and 120 kHz). The screen capture has been made while in *Replay* mode.

A Title Bar

The **Title Bar** contains icons to open the various information panes, as well as buttons to initiate specific functions.

B Echogram(s)

One or more *Echogram* is displayed using the largest portion of the screen. The presentation layout is controlled by the function buttons on the **Status bar**. You can display individual echograms for each frequency in use, or you can lay out the presentation of all frequencies either horizontally or vertically.

Additional information panes may be selected on the **Title Bar** using the relevant icons.

In the **Display Options** dialog you can define the contents of a special tooltip pane. It will automatically follow the position of the cursor, and provide additional detailed information from the echogram.

C Main menu

The menu system is by default located at the right side of the display presentation. The main menu is always visible, but may be hidden from view. To open a sub-menu, click one of the icons at the bottom of the main menu.

D Taskbar

The **Taskbar** stretches across the entire presentation width at the bottom of the display. On the left side, dedicated function buttons allows you to control the presentation layout.

E Replay bar

The **Replay bar** controls the playback when in *Replay* mode. It is only visible in this mode.

For a more detailed description of the echogram presentations and the display views, see chapter *Display views*.

→ *Display views* on page 40

Title Bar

The ES70 **Title Bar** is located on the top of the display presentation, and it is stretched from the far left to the far right side.

The **Title Bar** provides buttons to hide or show the menu, to make a screen capture, to open the **Messages** dialog, and to open the context sensitive on-line help. It also provides navigational information, as well as a few buttons related to operating system features.

The **Title Bar** also provides dedicated buttons to open the various information panes.

For more detailed information about the **Title Bar**, see chapter *Display views*.

→ *Title Bar* on page 43

Figure 7 Title Bar



The following information elements are placed on the **Title Bar**:

- a Logo and product name:** This element identifies the manufacturer and the product.
→ *Logo and product name* on page 43
- b Operation buttons:** These buttons are used to control basic operational functions.
→ *Operation buttons* on page 44
- c Information panes:** The icons are used to open and close dedicated information panes.
→ *Information pane icons* on page 44
- d Navigational information:** These are not buttons, but information fields providing current data related to the vessel movements.
→ *Navigational information* on page 46
- e Function buttons:** These buttons are used to control basic functions such as screen captures, help, menu appearance
→ *Function buttons* on page 47

Taskbar

The **Taskbar** is located at the bottom of the display . The **Taskbar** contains tabs to control the echogram presentations. It also provides time and date information.

Figure 8 Taskbar



- A *Echogram browser*
- B *Presentation format*
- C *Transducer/echogram presentation*
- D *Date*
- E *Time*

For more information, see the *Display views* chapter.

→ *Taskbar* on page 67

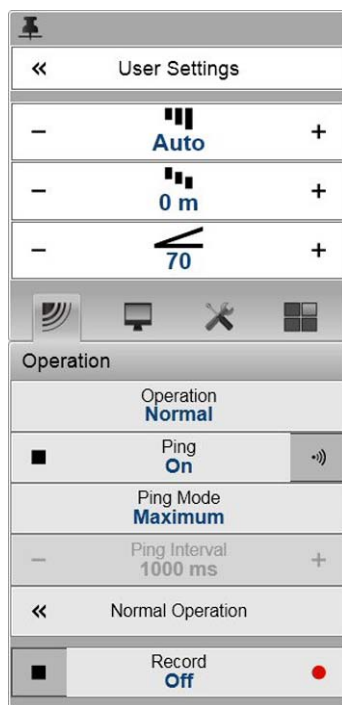
The menu system

This section provides a short introduction to the menu system, and explains the basic use of the ES70 menu buttons.

For more information about the menu system, see *The menu system* on page 100.

The menu hierarchy

Figure 9 The Main menu (top) with the Operation sub-menu below



The menu system on the ES70 is by default placed on the right hand side of the display presentation. You can however easily move the menu to the left side using the **Display Options** dialog, or hide it from view with the **Menu** button on the **Title Bar**.

The main menu is short, and the four sub-menus are opened by clicking on the four icons.

- 1 The **Main** menu provides the parameters most frequently used during normal operation.
- 2 The **Operation** menu controls the main operational parameters.
- 3 The **Display** menu controls the visual aspects of the system, such as parameters related to the display presentation.
- 4 The **Setup** menu allows you to control the configuration of the signal processing, as well as system installation and maintenance, and the interfaces to peripheral devices.
- 5 The **Active** menu has its content linked to the current active item (view or object). Use it to access special features available for the selected item.

Menu buttons

Each menu contains several menu buttons. Each button shows the function of the button, some of them also display the current parameter setting. The majority of the buttons in each menu provide one or more of these functions:

- You can increase and decrease parameter values by clicking the [+] and [-] fields on the button.
- You can change parameter values by clicking on the button, holding the mouse depressed, and then moving the cursor sideways.
- You can change parameter values by means of the scroll wheel on the mouse or trackball.
- You can enter parameter values from the keyboard (if you have one).

- You can select parameter value from the button's sub-menu.
- You can open a dedicated dialog.

How to select a numerical parameter using the +/- buttons



- 1 Move the cursor to either side of the button, and observe that the background colour changes.
 - a Click on the left side of the button to decrease the numerical value.
 - b Click on the right side of the button to increase the numerical value.

How to select a numerical parameter by moving the cursor horizontally



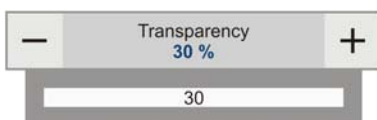
- 1 Place the cursor on the middle of the button.
- 2 Click and hold the left mouse button depressed.
- 3 Move the cursor horizontally: left to decrease the parameter value, or right to increase it.
- 4 Release the mouse button when the requested value is shown.

How to select a numerical parameter by means of the scroll wheel



- 1 Place the cursor on the middle of the button.
- 2 Spin the scroll wheel in either direction to increase or decrease the parameter value.
- 3 Release the scroll wheel when the requested value is shown.

How to select a numerical parameter using the keyboard



- 1 Click the middle section of the button to open a text field.
- 2 Enter the numerical value into the text field.

If the numerical value exceeds the permitted range for the parameter, the frame in the text field will be red. You will then not be able to enter the value.
- 3 Press the **Enter** key.

How to select a parameter using a sub-menu



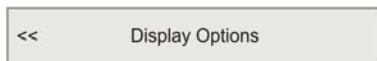
- 1 Click the middle section of the button to open a sub-menu, then click the requested parameter value.

The chosen value is applied, and the sub-menu is automatically closed.

- 2 Whenever applicable, you can also access the sub-menu by clicking the left and right side of the button, but this method will not show you the menu choices.
 - a Click on the left side of the button to select a lower sub-menu choice.
 - b Click on the right side of the button to select a higher sub-menu choice.

How to select parameters using a dialog

- 1 Click anywhere on the button to open a separate dialog.



Display views

The display views provided by the Simrad ES70 are based on the award winning design of the Simrad ME70 multibeam echo sounder. The menu system, presentation of data in the operational modes, and the user interface elements, have been created in close cooperation with designers and users.

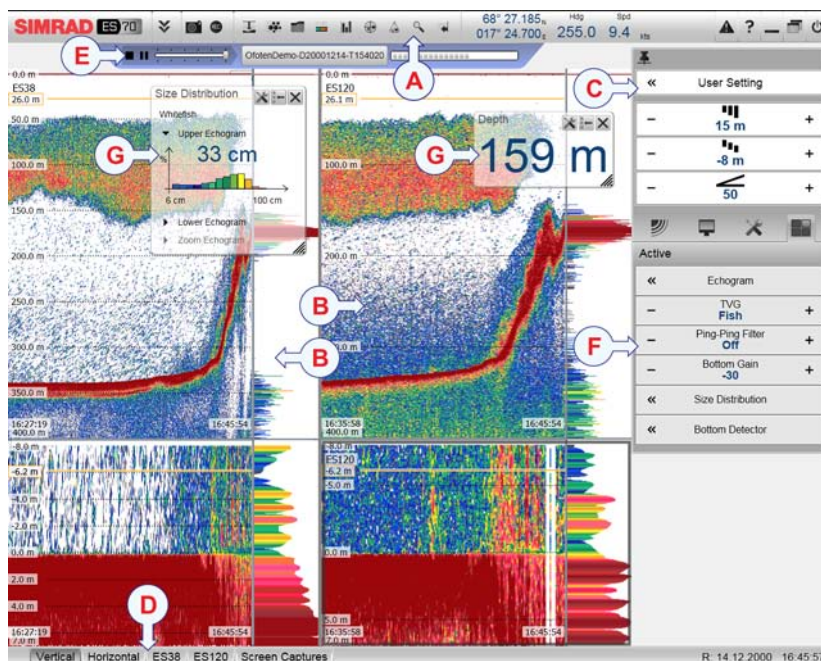
This chapter provides a brief overview of the information displayed by the Simrad ES70, and how the information is organised.

Topics

- *Display organisation* on page 41
- *Title Bar* on page 43
- *Replay bar* on page 49
- *Menu system* on page 50
- *Echograms* on page 50
- *Information panes* on page 58
- *Taskbar* on page 67
- *Screen captures* on page 69

Display organisation

Figure 10 Typical display presentation



A typical ES70 display presentation is shown.

A Title Bar

The **Title Bar** identifies the logo, and provides several icons and buttons. These are used to hide or retrieve the menu system and the information panes, and to enable basic system functions.

→ *Title Bar* on page 43

→ *Information panes* on page 58

B Echogram(s)

The **Echogram(s)** take up the largest part of the ES70 display presentation.

By default, you will have two echograms for each frequency channel (transceiver/transducer combination); surface related and bottom related. If you have more than one frequency channels, the echograms for each frequency can be presented horizontally with one over the other, or next to each other. This is controlled by tabs on the **Taskbar** (D).

→ *Echograms* on page 50

You can modify the size of the echograms by moving the boundary lines between the echograms. Click on a boundary line, hold the button depressed, and move the line horizontally or vertically.

If you click in an echogram, the echogram is selected to be “active”. The “active” echogram is identified with a thick border. If you change parameters related to the echograms, these are by default only applied to the “active” echogram.

C Main menu

The **Main** menu is by default located on the right hand side of the presentation. To open any of the sub-menus, click the icons. To hide or retrieve the **Main** menu, click the **Menu** button on the **Title Bar**.



→ *Menu system* on page 50

D Taskbar

The **Taskbar** is located at the bottom of the echo sounder presentation.

→ *Taskbar* on page 67

E Replay bar

During replay a dedicated **Replay bar** is shown below the **Title Bar**. The **Replay bar** allows you to retrieve saved files, and to control the playback.

→ *Replay bar* on page 49

F Sub-menus

Four sub-menus may be opened from the four icons in the bottom of the **Main** menu.



→ *Menu system* on page 50

G Information panes

You can choose from several **Information panes** to provide you with additional data. These panes are selected from the buttons on the **Title Bar**. The panes can be moved around on the echogram presentation, and you can change their sizes. The panes are transparent, so echogram information displayed behind them are not lost.

→ *Information panes* on page 58

Title Bar

The ES70 **Title Bar** is located on the top of the display presentation, and it is stretched from the far left to the far right side.

The **Title Bar** provides buttons to hide or show the menu, to make a screen capture, to open the **Messages** dialog, and to open the context sensitive on-line help. It also provides navigational information, as well as a few buttons related to operating system features.

The **Title Bar** also provides dedicated buttons to open the various information panes.

Figure 11 Title Bar



- A Logo and product name:** This element identifies the manufacturer and the product.
- B Menu:** Click this button to hide or recall the menu system.
- C Screen capture and Record:** Click these buttons to make a screen capture, and to start and stop a recording.
- D Information panes:** Click any of these buttons to open and close an information pane.
- E Navigation:** These are not buttons, but information fields providing current data related to the vessel movements.
- F Function:** These buttons are used to control basic system functions:
 - **Alarm:** Click this button to open the **Messages** dialog. This button will flash to indicate that a message is posted.
 - **Help:** Click this button to open the context sensitive on-line help.
 - **Off:** Click this button to close down the ES70 application.

Topics

- *Logo and product name* on page 43
- *Operation buttons* on page 44
- *Information pane icons* on page 44
- *Navigational information* on page 46
- *Function buttons* on page 47

Logo and product name



The Simrad logo and the product name (ES70) is shown.

Double-click the Simrad logo to reduce the size of the ES70 presentation. Double-click one more time to restore the original size.

Operation buttons

Menu button



Click once on the **Menu** button to hide the menu, and one more time to bring it back again. When the menu is hidden, it will temporarily be shown on the left or right hand side of the display if you move the cursor to that position.

Related topics

→ *The menu system* on page 100

Screen capture button



Click this button once to create a screen capture of the current echogram presentation. To view the recorded image, click **Screen Capture** on the **Taskbar** to open the image browser.

Related topics

→ *How to save a single echogram image* on page 75

→ *How to recall single echogram images* on page 77

→ *Screen captures* on page 69

Record button



Click this button to start and stop recording.

The recording function is set up using the parameters available on the **Record** button on the **Operation** menu.

Remember to stop the recording when you have finished the job! If you forget, your harddisk will soon be full!

Note

Raw data files will normally become very large. If you wish to record large amounts of echogram raw data, make sure that you have enough space on your hard disk. Unless your computer is equipped with a very large harddisk capacity, we recommend that you save the raw data to an external storage device.

Related topics

→ *How to save echogram sequences (raw data)* on page 75

→ *How to play back echogram sequences (raw data)* on page 77

Information pane icons

The Simrad ES70 offers several information panes to provide additional and detailed data from the echogram. The panes are opened and closed using the pane buttons on the **Title Bar**.

In order to open an information pane, you must first click in an echogram presentation to make it “active”. By doing this you select frequency channel (transducer). In most cases, the data in the information pane you open will only be valid for the selected echogram.

Some of the information panes are optional. They are thus not available for use unless a licence code is available. In order to obtain a licence, consult your local dealer.

Depth



Click this icon to open and close the **Depth** information pane. This pane provides the current depth as measured by the selected transducer.

→ *Depth information pane* on page 59

Biomass



Click this icon to open and close the **Biomass** information pane. This pane provides the current biomass as calculated by the echo sounder based on the current echogram.

Note that biomass is an optional function. In order to activate the **Biomass** information pane, you must obtain a software licence.

→ *Biomass information pane* on page 59

Bottom Hardness



Click this icon to open and close the **Bottom Hardness** information pane. This pane provides the bottom hardness in the current echogram.

Please note that bottom hardness is an optional function. In order to activate the **Hardness** line and the **Bottom Hardness** information pane, you must obtain a licence.

→ *Bottom Hardness information pane* on page 60

Colour Scale



Click this icon to open and close the **Colour Scale** information pane. This pane shows you the colours you are presently using in your echogram presentation. You can also manually modify the colour scale to filter out weak echoes.

→ *Colour Scale information pane* on page 60

Size Distribution



Click this icon to open and close the **Size Distribution** information pane. This pane shows you the size of the fishes currently located in your transducer beam.

The **Size Distribution** information pane is only available if your ES70 is equipped with one or more split beam transceivers.

→ *Size Distribution information pane* on page 62

Fish Position



Click this icon to open and close the **Fish Position** information pane. This pane shows you the position within the beam of the detected single echoes. The beam and the fish echoes are seen from above. The same echo information is also provided in the **Echo Position** information pane, but the beam is there seen from the side to add the depth perspective.

The **Fish Position** information pane is only available if your ES70 is equipped with one or more split beam transceivers.

→ *Fish Position information pane* on page 64

Echo Position



Click this button to open and close the **Echo Position** information pane. This pane shows you the position within the beam of the detected single echoes. The beam and echoes are viewed from the side. The same echo information is also provided in the **Fish Position** information pane, but the beam is there seen from above.

The **Echo Position** information pane is only available if your ES70 is equipped with one or more split beam transceivers.

→ *Echo Position information pane* on page 65

Zoom



Click this button to open and close the **Zoom** information pane. This pane allows you to zoom in on a selected area of the current echogram.

→ *Zoom information pane* on page 65

History

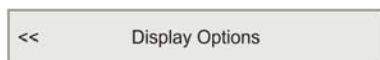


Click this button to open and close the **History** pane. The ES70 automatically and continuously saves the echograms as images in a buffer memory. This pane allows you to view these previously saved images for the currently active echogram.

→ *History information pane* on page 66

Navigational information

These are not buttons, but fields providing useful information related to the vessel movements. You can choose which information to be displayed if you open the **Display Options** dialog from the **Display** sub-menu.



Note

*This navigational information on the **Title Bar** must not be used for navigation!*

Geographical location



Provided that a GPS system is connected to the ES70, this field on the **Title Bar** will display the vessel's geographical position in longitude and latitude.

The communication with the external GPS system is set up using the **Navigation** button on the **Setup** menu.

Vessel heading



Provided that a GPS or compass system is connected to the ES70, this field on the **Title Bar** will display the vessel's current heading.

The communication with the external GPS system, heading sensor or gyro compass is set up using the **Navigation** button on the **Setup** menu.

Vessel speed



Provided that a GPS or speed log system is connected to the ES70, this field on the **Title Bar** will display the vessel's current speed.

The communication with the external GPS system or speed sensor is set up using the **Navigation** button on the **Setup** menu.

Water temperature



Provided that a temperature sensor is connected to the ES70, this field on the **Title Bar** will display the water temperature.

Depth



The current depth for each of the transducers connected to the ES70 can be shown.

Function buttons

The five function buttons are located on the far right side of the **Title Bar**.

Message button



This **Message** button will indicate when the ES70 system has issued a message. Click the button to open the **Message** dialog. If you hold the mouse cursor over the button, a tooltip rectangle will provide a list of the messages that you have not acknowledged.

Help button



Click this button to open the ES70 context sensitive on-line help. The button opens the help system on its start page.

Context sensitive on-line help is also available from the various dialogs in the ES70. Click any **Help** button [?] in the top right corner of any dialog to open the help system.

Minimize button



Click this button to minimize the ES70 display presentation. This is an operating system function.

To restore the presentation to its previous size, click the ES70 button on the operating system's taskbar.

Resize button



Click this button to change the size of the ES70 display presentation. This is an operating system function.

To restore the presentation to its previous size, click one more time on the **Resize** button.

Exit button



Click this button to close the ES70 program.

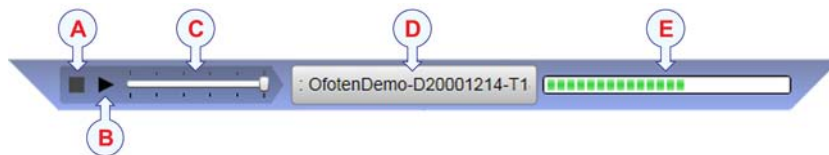
Observe the dedicated procedure to power down the ES70 system.

→ *Power off* on page 21

Replay bar

The **Replay Bar** is automatically activated once you select *Replay* mode. The bar is positioned directly below the **Title Bar**.

Figure 12 *Replay bar*



- A Stop:** Click this button to stop the playback.
- B Play/Pause:** Click this button to start the playback, or to pause it.
- C Replay speed:** Click this slider to adjust the replay speed.
- D File select:** This button shows which file you are currently playing, Click the button to open the **Replay** dialog.
- E Progress:** This bar shows you the replay progress of the current file. If you have chosen to loop the replay file(s), the green indicators will start from left every time the start of the file appears.

Menu system

The ES70 menu is located at the right side of the display. A detailed breakdown of the commands and parameters available from the menu system is given in the *Menu system* chapter.

→ *The menu system* on page 100

You can place the menu on the left side of the ES70 presentation by means of the **Menu on the right side** option in the **Display Options** dialog.

You can also hide the menu from view if you do not need it. Use the **Menu** button on the **Title Bar**. Click once to hide the menu, click one more time to retrieve it.



To access the parameters and functions provided by the sub-menus, click one of the menu icons under the **Main** menu. One click on an icon opens the sub-menu, the next click closes it.

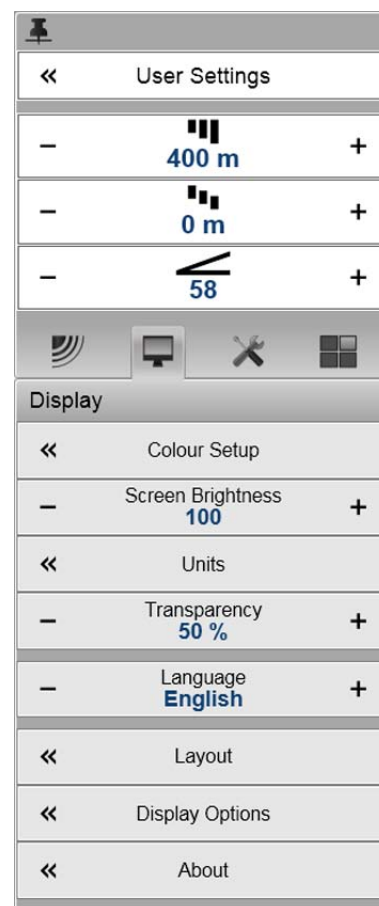


- 1 The **Main** menu provides the parameters most frequently used during normal operation.
- 2 The **Operation** menu controls the main operational parameters.
- 3 The **Display** menu controls the visual aspects of the system, such as parameters related to the display presentation.
- 4 The **Setup** menu allows you to control the configuration of the signal processing, as well as system installation and maintenance, and the interfaces to peripheral devices.
- 5 The **Active** menu has its content linked to the current active item (view or object). Use it to access special features available for the selected item.

For more information about the menu system, see the *Menu System* chapter.

→ *The menu system* on page 100

Figure 13 The Main menu (top) with the Display menu below



Echograms

The various echogram types supported by the ES70 are explained.

Surface echogram

This echogram is related to the sea surface. Start depth (upper echogram boundary) and vertical range (across echogram) are manually selected by the **Start Depth** and **Range** buttons on the **Main** menu.

- A** This is the start depth of the echogram.

In a surface echogram it is normally set up with **Start Range** = 0, or to a small value to start the echogram immediately under the keel.

- B** This is the bottom.

The total echogram range (A) to (F) is defined with the **Range** button on the **Main** menu. Unless specific conditions apply, or you wish to control the range manually, use **Range** = *Auto*.

- C** This text identifies the transducer used to create the echogram.

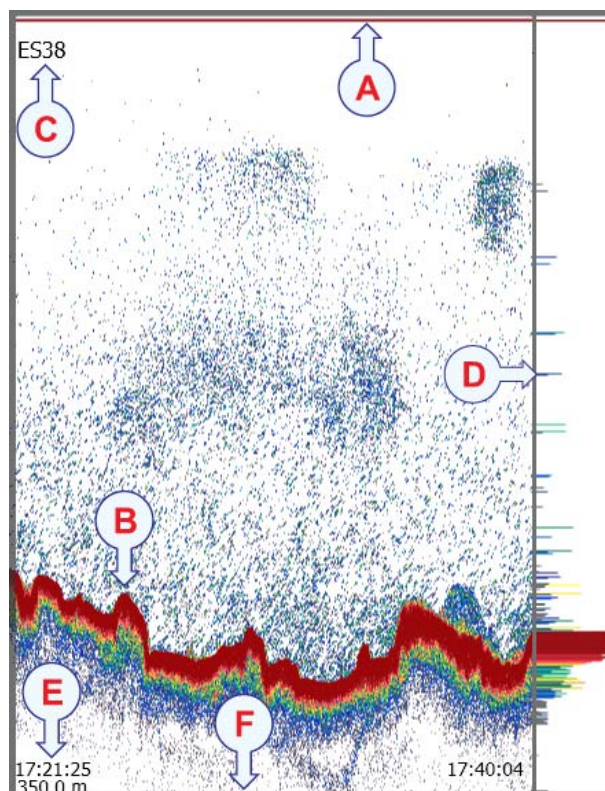
- D** This is the scope view.

This view presents individual colour lines. The colour and length of each line reflects the received echo amplitude.

- E** By default, the “ping time” and the depth range is shown in the bottom left side of the echogram. In the bottom right corner, the “ping time” is the same as current. This information can be changed using the options on the **Horizontal Axis** tab in the **Echogram** dialog.

- F** This is the lower end of the depth range. It is normally a few meters below the bottom contour, depending on the chosen range.

Figure 14 Surface echogram



Example 5 Start Range in a surface related echogram

In a surface echogram, set the **Start Range** value to 0 meters. This will make the echogram start from the sea surface (provided that the transducer offset has been defined). Set **Range** to the current depth plus 20 meters. The echogram will now show the area from the sea surface and down to 20 meters “below” the bottom. The bottom contour is easily detected when the depth changes.

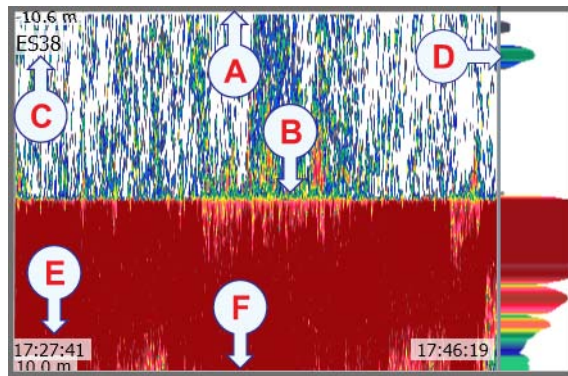
The biomass is automatically calculated based on choices you make in the **Calculation Interval** dialog; within a given time frame, a defined number of pings, or a portion of the echogram view. The data is then taken from an echo area starting immediately after the transmit pulse, and ending just over the detected depth. If you have limited your

vertical range (using the **Range** and **Start Range** settings), the resulting area is used for the biomass calculation. If the seabed is clearly defined with a unique bottom detection, the bottom echo will not be included in the calculations. Therefore, if you switch the bottom detector off, the bottom echo will be included in the calculation.

Bottom echogram

This echogram is related to the detected bottom. Stop depth (lower echogram boundary) and vertical range are manually selected by the **Start Depth** and **Range** buttons on the **Main** menu. The echogram is only drawn for pings having a successful bottom detection.

Figure 15 Bottom echogram



A This is the start depth of the echogram.

In a bottom echogram it is normally set up with **Start Range** set to a relative small negative value. The value defines how many meter above the bottom the echogram will start.

B This is the bottom.

Since the echogram is related to this bottom, it appears to be flat. Fishes close to the bottom is then

easy to see.

The range from the start depth above the bottom and down to some distance below the actual bottom is defined with the **Range** button on the **Main** menu.

Example 6 Start Range and Range in bottom related echogram

In a bottom echogram, set the **Start Range** value to –5 meters. This will make the echogram start from 5 meters above the bottom. Set **Range** to the 5 meters plus 10 = 15 meters. The echogram will now show the area from 5 meters above the depth, and down to 10 meters “below” the bottom. The bottom contour will appear as a flat line.

C This text identifies the transducer used to create the echogram.

D This is the scope view.

This view presents individual colour lines. The colour and length of each line reflects the received echo amplitude.

E By default, the “ping time” and the depth range is shown in the bottom left side of the echogram. In the bottom right corner, the “ping time” is the same as current. This information can be changed using the options on the **Horizontal Axis** tab in the **Echogram** dialog.

F This is the lower end of the depth range. It is normally a few meters below the bottom contour, depending on the chosen range.

The biomass calculation is made in the same way as for **Surface** echograms.

Pelagic echogram

The pelagic echogram appears very similar to the surface echogram. However, the biomass calculations are not limited by the bottom detection.

Example 7 Start Range in a pelagic echogram

In a pelagic echogram, set the **Start Range** value to 20 meters. This will make the echogram start from 20 meters below the sea surface (provided that the transducer offset has been defined). Set **Range** to 40 meters. The echogram will now show the area from 20 meters below the sea surface, and down to 60 meters below the transducer. Provided that the depth is larger than 60 meters, the bottom contour is not shown.

The biomass calculations are not restricted by the bottom detection. This means that the bottom echo will be included in calculations if it appears within the chosen range.

Trawl echogram

The echogram covers the vertical opening of the trawl with reference to the depth of the headrope.

In addition to the trawl opening, the echogram covers a certain range over and under the trawl opening. This range is set by adjusting the **Range** and **Start Range** parameters.

Trawl sensor systems (typically Simrad ITI and PI) communicate headrope depth, as well as the distance from the headrope to the footrope (trawl opening), to the ES70 at regular intervals. This information is required for the trawl echogram to be generated. Without the depth of the headrope, the echogram will appear like a standard pelagic echogram controlled by the **Range** and **Start Range** parameters.

The distance from the headrope to the footrope (trawl opening) can be manually set in the **Trawl** dialog. This is useful for trawl sensor systems not measuring the trawl opening, or when the measured distance is unreliable. The **Trawl** dialog also allows you to enter the distance from the vessel to the trawl opening. The depth of the headrope must however be provided by the catch monitoring system.

In the **Trawl** dialog you can also define the distance from the vessel to the trawl opening.

Example 8 Start Range and Range in a trawl echogram

In a trawl echogram, set the **Start Range** value to –5 meters. This will make the echogram start from 5 meters above the headrope. If the trawl opening is 20 meters, set **Range** to 30 meters. The echogram will now show the area from 5 meters above the headrope, down across the trawl opening, and down to 5 meters below the footrope. On a pelagic trawl, the bottom contour is normally not shown with these settings. On a bottom trawl, the bottom contour is shown once the trawl opening is less than 5 meters over the bottom.

The biomass calculations in a **Trawl** echogram are not restricted by the bottom detection. This means that the bottom echo will be included in the calculations if it appears within the chosen range.

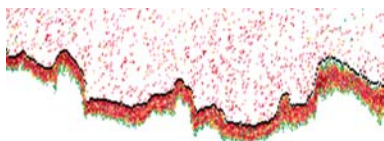
Lines, markers and annotations in the echograms

The echograms provided by the ES70 may contain additional information. The following lines, markers and annotations can be enabled:

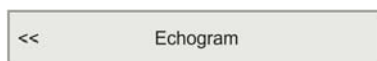
- *Bottom line* on page 54
- *White line* on page 54
- *Hardness line* on page 55
- *Trawl line* on page 55
- *Variable depth line* on page 56
- *Range other lines* on page 56
- *Biomass line* on page 57
- *Range scales* on page 57
- *Vertical ticks* on page 57
- *Annotations* on page 58

Bottom line

Figure 16 Bottom line example



The bottom contour may be enhanced by adding a bottom line. This is done in the **Echogram** dialog on the **Active** menu.



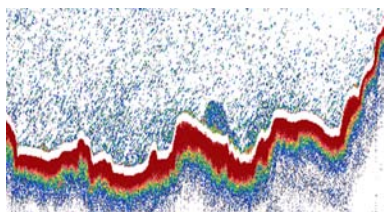
The bottom line appears as a black line, and follows the bottom contour.

Related topics

→ *How to establish horizontal markers* on page 84

White line

Figure 17 White line example



The bottom contour may also be enhanced by adding a white line.

The white line is an extra thick white line that is added to just below the bottom. The white line will not remove information, it will simply “push” the information further down in order to make the bottom easier to see.

The white line is enabled in the **Echogram** dialog on the **Active** menu. It can not be used simultaneously with

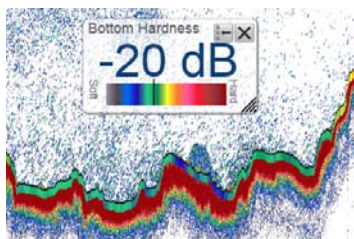
the hardness line.

Related topics

→ *How to establish horizontal markers* on page 84

Hardness line

Figure 18 Hardness line example



The bottom reflectivity (how “hard” it is) may be monitored using the **Hardness** line.

The **Hardness** line is an extra thick colour coded line that is added to just below the bottom. The line will not remove information, it will simply “push” the information further down in order to make the bottom easier to see. The colour coding contains the hardness information.

You may find it useful to open the **Bottom Hardness** information pane to observe the scale. The colours on the left side of the scale indicate a soft bottom, while the colours on the right hand side indicate a harder bottom. The information pane also provides the current reflectivity measured in dB.

Please note that bottom hardness is an optional function. In order to activate the **Hardness** line and the **Bottom Hardness** information pane, you must obtain a licence.

The **Hardness** line can not be used simultaneously with the white line.

The **Hardness** line is enabled in the **Echogram** dialog.

Related topics

- *Bottom Hardness information pane* on page 60
- *How to establish horizontal markers* on page 84

Trawl line

Whenever available and connected, trawl systems (PI and ITI) communicate headrope depth and/or headrope-to-footrope distance to the ES70 at regular intervals. The information from these sensors are drawn as horizontal lines on the ES70 echogram.

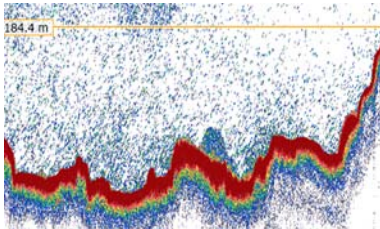
The trawl line is enabled in the **Echogram** dialog on the **Active** menu.

Related topics

- *How to establish horizontal markers* on page 84

Variable depth line

Figure 19 Variable Depth line example



When enabled a horizontal depth line is placed wherever you click in the echogram. This is typically used to measure the water depth, the depth of a school, or even single fish.

You can click on the line, keep the mouse button depressed, and then drag the line up or down.

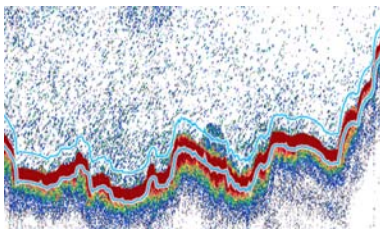
The variable depth line is enabled in the **Echogram** dialog on the **Active** menu.

Related topics

→ *How to establish horizontal markers* on page 84

Range other lines

Figure 20 Range Other lines, example



This feature is used when you set up your ES70 with both a surface related and bottom related echogram shown simultaneously.

When enabled, two horizontal lines in the surface echogram indicate the range selected in the bottom echogram.

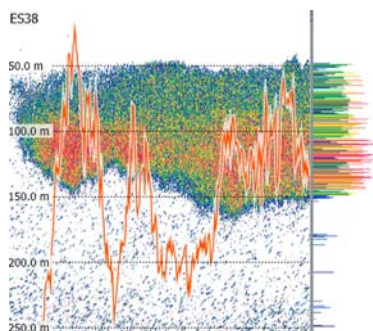
The range other lines function is enabled in the **Echogram** dialog on the **Active** menu.

Related topics

→ *How to establish horizontal markers* on page 84

Biomass line

Figure 21 Biomass line, example



The biomass may be monitored using the **Biomass** line.

The biomass line is an extra thick brightly coloured line that is added to the echogram. The line will identify the variations in biomass. To adjust the view, use the scale.

The changes made in the **Calculation Interval** dialog will not have an effect on the **Biomass** line.

Remember that you can also measure the biomass using the **Biomass** information panel.

Note that biomass is an optional function. In order to activate the **Biomass** information pane, you must obtain a software licence.

The biomass line is enabled in the **Echogram** dialog. You can change the scale of the curve to fit the vertical space available on the echogram.

Related topics

- *Biomass information pane* on page 59
- *How to establish horizontal markers* on page 84

Range scales

Range scales in the echogram can be enabled in the **Echogram** dialog.



Related topics

- *How to establish horizontal markers* on page 84

Vertical ticks

When enabled in the **Echogram** dialog, this function places vertical markers on the echogram.

The different vertical tick types are:

a Time

This option places a short vertical line is drawn in the upper part of the echogram once every specified number of minutes.

b Distance

This option inserts a short vertical line is drawn in the upper part of the echogram once every specified number of nautical miles.

Annotations

Annotations may be added to the echogram to pinpoint special echoes, special events, etc. An annotation can be entered manually using the **Annotation** dialog, or they can be imported from peripheral devices.

In order to see the annotations on the echogram, they must be enabled in the **Echogram** dialog.

Information panes

The Simrad ES70 offers several information panes to provide additional and detailed data from the echogram. The panes are opened and closed using the pane buttons on the **Title Bar**.

In order to open an information pane, you must first click in an echogram presentation to make it “active”. By doing this you select frequency channel (transducer). In most cases, the data in the information pane you open will only be valid for the selected echogram.

Some of the information panes are optional. They are thus not available for use unless a licence code is available. In order to obtain a licence, consult your local dealer.

About information panes

You can change the size of the information pane to suit your preferences, and you can move it within the echogram presentation it is valid for.

- To change its size, click on the shaded area in the bottom right corner, hold the mouse button depressed, and drag to requested size.
- To move an information pane, just click inside it, hold the mouse button depressed, and move it to requested position.

The information panes are transparent, so you can safely place a pane on top of the echogram without losing the information behind it. The degree of transparency is controlled by the **Transparency** button on the **Display** menu.



All information panes are provided with small buttons in the top right corner.

- The top right button [X] closes the information pane.

Note that you can also close the pane if you click one more time on its button on the **Title Bar**.

- The other button will restore the information pane to its original size and location.
- Some of the information panes are provided with a “tool” button. This button opens a dialog relevant to the information shown in the pane.

Depth information pane

Figure 22 Depth information pane



To open this information pane, click the **Depth** icon on the **Title Bar**.



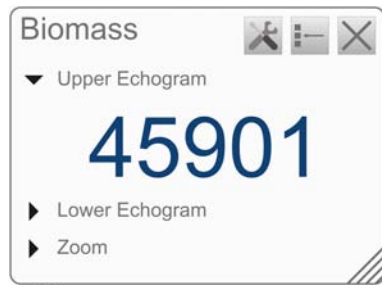
The **Depth** information pane displays the current depth for the chosen transducer and frequency.

The **Tool** button opens the **Bottom Detector** dialog. This dialog is also available from the **Active** menu.

The purpose of the **Bottom Detector** dialog is used to define the upper and lower depth limits most likely to be used during the ES70 operation. In this dialog, you can also modify the setting for **Bottom Backstep** to change the bottom detection relative to the bottom echo.

Biomass information pane

Figure 23 Biomass information pane



To open this information pane, click the **Biomass** icon on the **Title Bar**.

The **Biomass** information pane displays the current biomass. The calculation is based on the selection you have made in the **Calculation Interval** dialog; time, ping or a chosen part of the current view. Only the biomass calculated for the current transducer and frequency is shown.

The **Tool** button opens the **Calculation Interval** dialog. This dialog is also available from the **Setup** menu.

Note that biomass is an optional function. In order to activate the **Biomass** information pane, you must obtain a software licence.

You can see biomass information from three different sources:

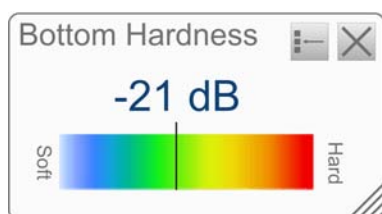
- **Upper Echogram:** This biomass value is calculated from the fish echoes from the top echogram for the chosen channel.
By default, this is a surface echogram.
- **Lower Echogram:** This biomass value is calculated from the fish echoes from the bottom echogram for the chosen channel.
By default, this is a bottom echogram.
- **Zoom:** This biomass value is calculated from the fish echoes from the currently zoomed area.

Related topics

- *Biomass line* on page 57
- *How to monitor the current biomass* on page 94
- *How to enable the biomass line* on page 95
- *About biomass* on page 108

Bottom Hardness information pane

Figure 24 Bottom Hardness information pane



To open this information pane, click the **Bottom Hardness** icon on the **Title Bar**.



The **Bottom Hardness** information pane displays the current bottom reflectivity. This gives an indication to how hard the bottom is. The value is calculated using the bottom echo strength in the current ping.

Please note that bottom hardness is an optional function. In order to activate the **Hardness** line and the **Bottom Hardness** information pane, you must obtain a licence.

The vertical line in the hardness colour scale positions the current ping. The hardness of the current ping is also shown with the numerical value.

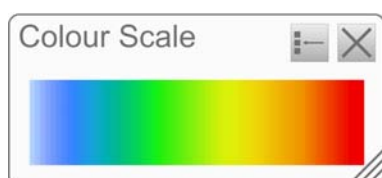
The bottom hardness can also be indicated by enabling the bottom hardness line in the **Echogram** dialog. This line uses the same colour coding as the information pane, but places this as a thick line immediately under the bottom line in the echogram.

Related topics

- *Hardness line* on page 55

Colour Scale information pane

Figure 25 Colour Scale information pane



To open this information pane, click the **Colour Scale** icon on the **Title Bar**.



The **Colour Scale** pane displays the current colour scale you are using for the echogram presentation.

To change the colour scale, click **Colour Setup** on the

Display menu.





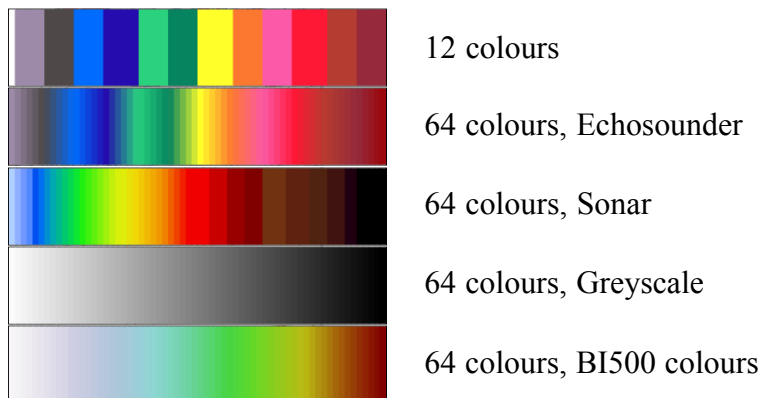
By default you have 64 or 12 colours available to present the echograms, and a selection of palettes. The colour scale can be retrieved any time by clicking the **Colour Scale** icon on the **Title Bar**.

Which colour scale to use is defined in the **Colour Setup** dialog on the **Display** sub-menu.

You can filter out the weakest echoes by manually modifying the colour threshold.

- 1 Click the **Colour Scale** icon on the **Title Bar** to open the **Colour Scale** information pane.
- 2 Move the cursor to the left side of the colour scale.
Observe that the cursor changes shape to a dual arrow line.
- 3 Click on the left edge of the colour scale, keep the mouse button depressed, and drag the edge towards right.
- 4 Observe that the weakest colours are removed from the colour scale, and thus also the weakest echoes from the echogram presentation.
- 5 Release the mouse button.
- 6 In order to restore the weakest colours, click on the left edge of the current colour scale, and drag towards left.

Figure 26 Colour scales using 12 and 64 colours

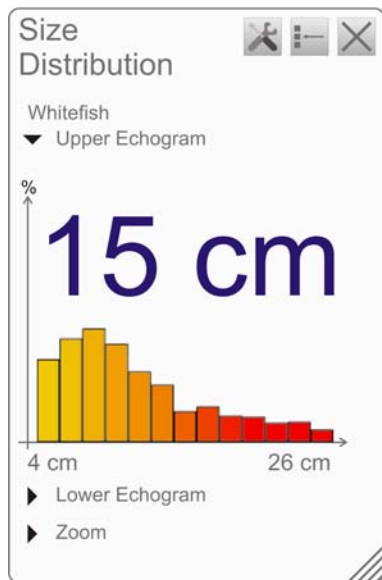


Related topics

- *How to change the colour scale and presentation palette on page 80*
- *How to change the number of colours in the echogram on page 80*

Size Distribution information pane

Figure 27 Size Distribution information pane



To open this information pane, click the **Size Distribution** icon on the **Title Bar**.



The **Size Distribution** information pane shows a histogram of the single fish echoes detected. The calculation is based on the parameters you have selected in the **Calculation Interval** dialog; time, ping or a chosen part of the current view. It thus provides a visual indication on how large the fishes are within the chosen interval.

Only the fishes detected by the current transducer frequency are shown.

The large number above the histogram shows the average size of all the fishes in the histogram. The value is presented in the unit you have chosen in the **Units** dialog. For an accurate x-axis value, place the

cursor on a vertical bar in the histogram, and read the value from the label.

The abbreviation TS is commonly used. It means “Target Strength”, and this is a measure of how strong echo the individual fishes in the current echogram generate. The echo strength indicates the size of the fishes. The **Size Distribution** information pane thus provides a mathematical estimate of the sizes of all the chosen fish species in the echogram.

The target strength from a fish varies from specie to specie. To change the fish species, use the **Fish Select** dialog opened on the **Setup** menu.

Note

*The **Size Distribution** information pane is only available if your ES70 is equipped with one or more split beam transceivers.*

The following information is provided in the **Size Distribution** information pane.

- 1 **Fish species:** The current fish species, as selected in the **Fish Select** dialog, is shown.
- 2 **Echogram:** You can see size distribution histograms from three different sources.
 - **Upper Echogram:** This histogram is created based on fish echoes from the top echogram for the chosen channel. By default, this is a surface echogram.

The data is calculated based on the selection you have made in the **Calculation Interval** dialog.

- **Lower Echogram:** This histogram is created based on fish echoes from the bottom echogram for the chosen channel. By default, this is a bottom echogram.

The data is calculated based on the selection you have made in the **Calculation Interval** dialog.

If you have selected only a small vertical range close to bottom, the histogram may be empty. This because the fish volume is small due to the limited range selected, and because the target strength algorithm must take into consideration other bottom echoes than fish.

- **Zoom:** This histogram is created based on fish echoes from the currently zoomed area.

3 Mean value: The large number above each histogram is the mean value from the tallest bar. The unit reflects the mode chosen in the **Size Distribution** dialog.

To change the settings in the histogram, click **Size Distribution** on the **Active** menu.

The **Size Distribution** dialog allows you to shape the histogram in the **Size Distribution** information panel to your own requirements. You can set up the mode, the upper and lower limits, the accuracy, and the vertical resolution.

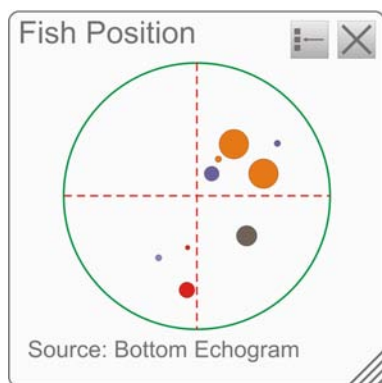


Related topics

- *How to monitor the fish size distribution* on page 93

Fish Position information pane

Figure 28 Fish Position information pane



To open this information pane, click the **Fish Position** icon on the **Title Bar**.



The **Fish Position** information pane shows the position within the beam of the detected single echoes for the current ping (largest circles) and the three previous ping (smaller circles). The view is “from above”. The colours indicate the echo strength.

Note

*The **Fish Position** information pane is only available if your ES70 is equipped with one or more split beam transceivers.*

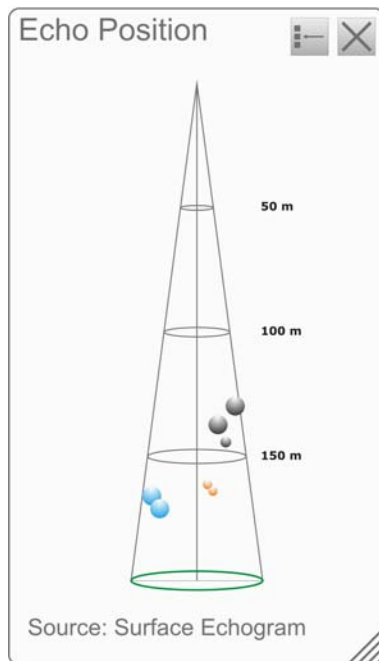
Parameters

1 Source

This is the source of the fish position information. In the example, the surface echogram is used to determine the latest fish positions.

Echo Position information pane

Figure 29 Echo Position information pane



To open this information pane, click the **Echo Position** icon on the **Title Bar**.



The **Echo Position** pane shows the position within the beam of the detected single echoes for the current ping (largest circles) and the three previous ping (smaller circles). The colours indicate the echo strength. This is basically the same view as the **Fish Position**, however the echoes are here viewed from the side and not from above.

Note

*The **Echo Position** information pane is only available if your ES70 is equipped with one or more split beam transceivers.*

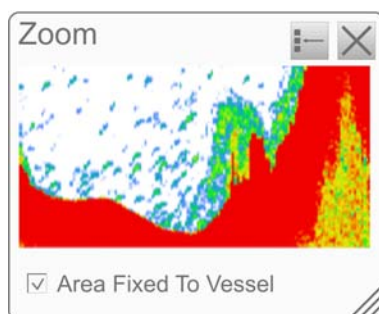
Parameters

1 Source

This is the source of the echo position information. In the example, the surface echogram is used to determine the latest echo positions.

Zoom information pane

Figure 30 Zoom information pane



To open this information pane, click the **Zoom** icon on the **Title Bar**.

The **Zoom** information pane allows you to zoom in on a chosen area on the current echogram.

Once the **Zoom** information pane is opened, the zoomed area is visible as a dotted rectangle on the echogram. You can change this zoomed area to any size and shape, the echoes inside the zoomed area will always

be shown in the **Zoom** information pane.

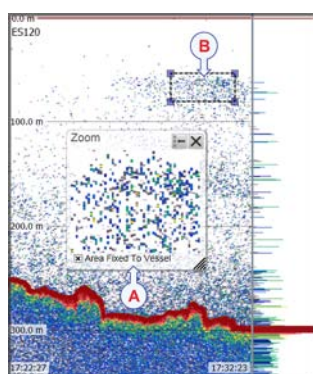
Parameters

1 Area Fixed To Vessel

When the rectangular zoomed area is established, it can either follow the echogram while it moves towards the left, or it can stay put.

When **Area Fixed To Vessel** is active, the zoomed area will be permanently positioned on the echogram. The echoes will then run through the area, and thus also through the **Zoom** information pane.

Figure 31 Zoom example



A **Zoom** information pane

B Zoomed area rectangle

In this example, the zoomed area rectangle is positioned directly above the **Zoom** information pane. If you click on any of the four corners of the rectangle, you can drag it to any size and shape.

History information pane

Click the **History** icon on the **Title Bar** to enable this function.

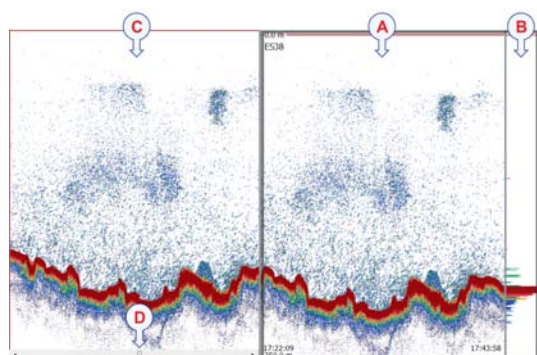


The **History** information pane does not use the same presentation method as the other panes. The function allows you to view previously recorded echogram sequences. In order to do this, the current “active” echogram is split in two, and the left side is used to display the recorded history.

This function is used to store echograms on bitmap format. The ES70 will continuously save echogram pictures to its internal hard disk. These can be recalled on the display. The information in the **History** presentation is the same as on the original echogram presentation.

The number of history files is limited. After reaching the maximum number of files, the newest echogram picture overwrites the oldest one. The history function still allows you to quickly look through echogram pictures covering several hours.

Figure 32 History presentation



- A The original “active” echogram presentation
- B The original scope view presentation
- C The History presentation
- D Click this button and drag sideways to scroll through the recorded images

The horizontal width of the history presentation can be adjusted by clicking the right border, and dragging it sideways.

Taskbar

The **Taskbar** is located at the bottom of the display . The **Taskbar** contains tabs to control the echogram presentations. It also provides time and date information.

Figure 33 Taskbar



- A Echogram browser
- B Presentation format
- C Transducer/echogram presentation
- D Date
- E Time

The **Taskbar** contains the following information:

A Screen Captures

This tab hides the current “live” echograms from view, and allows you to see the echogram images you have previously saved using the **Screen Capture** button on the **Title Bar**.

The echograms are presented in a graphic browser. You can open any of the images for a closer study, or you can access the files directly by clicking the **Open Image Folder** button.

→ *Title Bar* on page 43

→ *Screen captures* on page 69

B Presentation format

If only one active frequency channel is in use, you will have only one echogram. These tabs are then not shown.

- **Vertical:** This tab places your current echograms next to each other in a vertical presentation.
- **Horizontal:** This tab places your current echograms on top of each other in a horizontal presentation.

C Transducer presentation

These tabs will reflect the actual transducers used by the echo sounder. The two transducers shown here are just an example. If only one transducer is in use, you will have only one echogram. These tabs are then not shown.

- **ES38:** This tab allocates the echo sounder presentation to only show the echogram from this transducer.
- **ES120:** This tab allocates the echo sounder presentation to only show the echogram from this transducer.

D Date

This field on the taskbar presents the current date.

Note that during replay, the date of the replay file is shown. An “R” is displayed in front of the date to identify this.

E Time

This field on the taskbar presents the current time.

Note that during replay, the times in the replay file is shown.

Related topics

- *How to select presentation layout* on page 79

Screen captures

The ES70 provides a built-in screen capture function, and a browser to view the saved images.

Figure 34 Screen capture browser



To save an echogram, click the **Screen Capture** button on the **Title Bar**.



To view the recorded image, click **Screen Capture** on the **Taskbar** to open the image browser.

Click **Open Image Folder** to open the operating system folder containing the files. This folder offers operating system functionality to provide renaming, copying, printing and deleting files.

Operational procedures

This chapter contains several operational procedures explaining how you can put your Simrad ES70 to use.

Menu navigation employed by Simrad ES70 is similar to the other Simrad applications which follow the user interface standards developed by Simrad. The main menu is normally located at the right side of the screen, and by means of dedicated icons at the bottom of the main menu, you can open the relevant sub-menus or dialogs. Menu choices shown in dark colours are not available for the current operation or operational mode.

Are there any procedures missing? Are you performing an operation that we have not explained? Write an e-mail to simrad.support@simrad.com and ask. We may then include the procedure in the next version of this manual.

Topics

- *User settings* on page 71
- *User preferences* on page 73
- *Save and recall echograms* on page 75
- *Views* on page 79
- *Echogram* on page 81
- *Ranges* on page 88
- *Bottom detection* on page 90
- *Size distribution, biomass and fish density* on page 92
- *Gain* on page 95
- *Power and pulse duration* on page 97

Related topics

- *Power on* on page 20
- *Power off* on page 21

User settings

The ES70 allows you save an unlimited number of user settings ^[4]. All parameters you have entered to set up the ES70 to suit your preferences are then saved, and you can use any name - including your own - to identify the saved settings. Whenever required, you can retrieve these settings, and continue your work.

To reset the entire ES70, you can also retrieve the factory default settings.

Topics

- *How to save the current user settings* on page 71
- *How to use previously saved settings* on page 71
- *How to reset the ES70 to factory default parameters* on page 72

How to save the current user settings

This procedure explains how to save the current configuration and parameter settings.

If you have several users with favourite configurations, if you work with different gears, or with different hardware configurations, depth or bottom conditions, we recommend that you save the ES70 operational parameters for future use.

- 1 Observe the **Main** menu. It is normally located on the right hand side of the ES70 presentation.
- 2 Click the **User Settings** button to open the **User Settings** dialog.



- 3 In the **User Setting** dialog, click the **Save Current Setting** button.
- 4 In the **Setting** dialog, click **OK** to accept the suggested name.
- 5 You can also choose a different name.

If you have a keyboard connected to the ES70 computer, you can click in the text field, remove the suggestion, and enter any name.

If you do not have a computer keyboard connected to your ES70 system, click the **Keyboard** button to open an on-screen keyboard.

Click **OK** to save the settings with the chosen name.

- 6 Observe that the name you have chosen appears on the **Saved Settings** list.
- 7 Click **OK** to save the current settings and close the dialog.

How to use previously saved settings

If you have saved sensor configurations dedicated for different gears or different tasks, you can retrieve these for fast and efficient parameter setup.

4. The number of user settings you can save is limited only by the size of your hard disk.

- 1 Observe the **Main** menu. It is normally located on the right hand side of the ES70 presentation.
- 2 Click the **User Settings** button to open the **User Settings** dialog.



- 3 In the **User Setting** dialog, click once on the requested saved settings in the **Saved Settings** list.
- 4 Click **Activate Selected Setting**.
- 5 Click **OK** to save the current settings and close the dialog.

How to reset the ES70 to factory default parameters

If the current settings are unreliable, or you simply wish to reset the ES70 to a known set of parameters, choose the factory setting provided.

- 1 Observe the **Main** menu. It is normally located on the right hand side of the ES70 presentation.
- 2 Click the **User Settings** button to open the **User Settings** dialog.



- 3 In the **User Settings** dialog, click **Simrad Factory Default** in the top text field.
- 4 Click the **Activate Selected Setting**, then click **Close**.

User preferences

This section provides procedures related to user preferences and individual customising.

Topics

- *How to select menu language on page 73*
- *How to choose colour presentation theme (palette) on page 73*
- *How to choose screen brightness on page 74*
- *How to select measurement units on page 74*

How to select menu language

The menu buttons – as well as other text – in the ES70 presentation are available in several languages.



- 1 Observe the **Main** menu. It is normally located on the right hand side of the ES70 presentation.
- 2 Click the **Display** icon under the **Main** menu to open the **Display** menu.



→ *Display menu* on page 105

- 3 Click the middle of the **Language** button to open the list of available languages. You can also click the [+] and [-] characters on the button to leaf through the list of available languages.
- 4 Click once on the language you wish to use.
- 5 Observe that the sub-menu is closed, and that all text in the menu buttons change to the selected language.

The context sensitive on-line help file may also be available in your language. To change the language in the on-line help, restart the ES70. If your language is *not* offered, the English on-line help will appear.

How to choose colour presentation theme (palette)

The ES70 presentation may be set up using one of several colour themes. In the menu system, these are called *palettes*.

The **Palette** parameter allows you to select the background colours and day/night contrast of the display presentation in order to suit you personal preferences.

The choice you make here does not have any effect on the ES70 performance.

- 1 Click the **Display** icon under the **Main** menu to open the **Display** menu.



→ *Display menu* on page 105

- 2 Click the **Colour Setup** button to open the **Colour Setup** dialog.
Observe the **Palette** choices.
- 3 Click the palette you wish to use. The changes are made immediately.

How to choose screen brightness

This procedure explains how to reduce the intensity of the light emitted from the display.

When the bridge is dark, the light emitted by the ES70 display can affect your night vision. In order to compensate for this, you can reduce the intensity. The **Screen Brightness** allows you to reduce the this brightness, and hence make the display darker. The intensity of light emitted by the display can be reduced from 100% to 0% in steps of 10.

- 1 Click the **Display** icon under the **Main** menu to open the **Display** menu.



→ *Display menu* on page 105

- 2 Click either side of the **Screen Brightness** button to make the adjustment.



How to select measurement units

This procedure explains how to change the measurement units in the ES70 presentations.

Use the **Units** dialog to set up the various units of measurements you wish to work with. The ES70 will use these in all presentations. Normally, you will only need to define these once.

Use the spin boxes in the dialog to make the selections.

- 1 Click the **Display** icon under the **Main** menu to open the **Display** menu.



→ *Display menu* on page 105

- 2 Click **Units** to open the **Units** dialog.



- 3 Make the necessary adjustments.
- 4 Click **OK** to save the current settings and close the dialog.

Save and recall echograms

These procedures explain how to save and recall echogram images and raw data.

Topics

- *How to save a single echogram image* on page 75
- *How to save echogram sequences (raw data)* on page 75
- *How to recall single echogram images* on page 77
- *How to play back echogram sequences (raw data)* on page 77
- *How to access raw data files* on page 78

How to save a single echogram image

On the ES70, you can save echograms i three different ways.

- 1 Bitmap images are saved whenever you click the **Screen Capture** button on the **Title Bar**. These images are recalled by means of the **Screen Capture** button on the **Taskbar**.
- 2 Echogram sequences (raw data) are recorded using the **Record** function on the **Operation** menu. These sequences are played back by placing the ES70 in *Replay* mode.
- 3 A “history file” is recorded automatically and continuously. When the file is full, it will start to overwrite the oldest data, thus creating a “ring buffer”. To play back the history file, click the **History** button on the **Title Bar**.

This procedure explains how to save a single echogram image as a bitmap file.

- 1 Observe the **Screen Capture** button on the **Title Bar**.



- 2 Click the button to save the current display presentation.
The screen capture is saved on the hard disk in standard JPG format.
It includes the entire presentations, and thus includes the current echograms and the menu.
- 3 To recall the screen capture, see *How to recall single echogram images* on page 77.

How to save echogram sequences (raw data)

On the ES70, you can save echograms i three different ways.

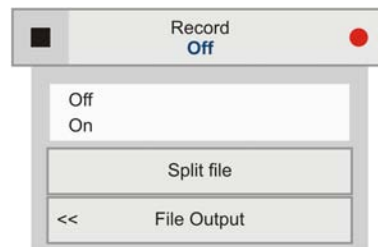
- 1 Bitmap images are saved whenever you click the **Screen Capture** button on the **Title Bar**. These images are recalled by means of the **Screen Capture** button on the **Taskbar**.
- 2 Echogram sequences (raw data) are recorded using the **Record** function on the **Operation** menu. These sequences are played back by placing the ES70 in *Replay* mode.

- 3 A “history file” is recorded automatically and continuously. When the file is full, it will start to overwrite the oldest data, thus creating a “ring buffer”. To play back the history file, click the **History** button on the **Title Bar**.

This procedure explains how to store raw echogram data. Each sequence of raw data – often regarded as a “line” during a survey – contains a set of echogram data saved on digital format. Once saved, you can play back this data just as if it was “normal” echogram data.

Note

Raw data files will normally become very large. If you wish to record large amounts of echogram raw data, make sure that you have enough space on your hard disk. Unless your computer is equipped with a very large harddisk capacity, we recommend that you save the raw data to an external storage device.



- 1 Click the **Operation** icon under the **Main** menu to open the **Operation** sub-menu.



→ *Operation menu* on page 104

- 2 Click **Record** to open the sub-menu.
- 3 Click **File Output** to open the **File Output** dialog.
- 4 In the **File Output** dialog:
 - a On the **Directory** tab, define the file output directory.

These are the default directories for raw data:

Windows XP

c:\documents and settings\all users\application data\simrad\ES70\data

Windows 7

c:\programdata\simrad\ES70\data

- b On the **Raw Data** tab, click **Save Raw Data** to enable this export.

Raw data are the echo data received directly from the output of the transceiver. The data can later be replayed on the ES70. The data contain sample data, echo sounder configuration data, navigation data (NMEA format) and annotations (if any).
 - c Define any other parameters to fit your requirements.
- 5 Click **OK** to save the current settings and close the dialog.
- 6 To start recording, you have two choices:
 - a In the **Record** button, select *On*.

- b On the **Title Bar**, click the **Record** button.



When activated, the **Record** button is red.

- 7 To stop recording, you have two choices:
- a In the **Record** button, select *Off*.
 - b On the **Title Bar**, click the **Record** button.



When not activated, the **Record** button is black.

- 8 To play back the raw data files, see *How to play back echogram sequences (raw data)* on page 77.

How to recall single echogram images

This procedure explains how you can recall single echogram images.

- 1 On the **Taskbar**, click **Screen Captures**.
Observe that the built-in image browser starts. All the currently saved echogram images are shown as miniatures.
- 2 Double-click on the miniature you wish to enlarge.
- 3 Click **Return To Browser** to close the image.

Return To Browser

How to play back echogram sequences (raw data)

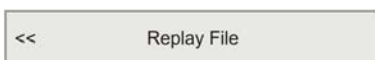
This procedure explains how you can play back (recall) echogram sequences (raw data).

- 1 Click the **Operation** icon under the **Main** menu to open the **Operation** sub-menu.



→ *Operation menu* on page 104

- 2 Click **Replay File** to open the **Replay File** dialog.



The purpose of the **Replay File** dialog is to choose the file(s) to be used for echogram playback. The file names listed have been generated automatically, and each file is identified with the time and date it was made.

- 3 If you wish to run the replay continuously, click **Loop** in the **Replay File** dialog.

- 4 Click **OK** to save the current settings and close the dialog.
- 5 In the **Operation** sub-menu, click **Replay** to select the function.
Observe that the **Replay bar** opens.
→ *Replay bar* on page 49
- 6 Click the start button in the **Replay bar** to start the playback.
- 7 To stop the playback, you have two choices:
 - a Click the stop button in the **Replay bar**
 - b Go back to normal operational mode.

How to access raw data files

Once raw data files have been recorded, you may also wish to copy or move them from the computer's harddisk to a separate storage media. This procedure explains how to access the files, and how to copy them to a separate storage device.

This procedure assumes that you are familiar with the Microsoft® XP® and/or Microsoft® 7 operating system utilities for file handling.

- 1 On the **Status Bar**, click the **Screen Captures** tab to open the browser.
- 2 In the browser, click **Open Image Folder** to open an operating system folder.

By default, the folder name is:

Windows XP	c:\documents and settings\All Users\Application data\Simrad\ES70\ScreenDumps
Windows 7	c:\programdata\Simrad\ES70\ScreenDumps

- 3 Use the functionality provided by the operating system to navigate to the file folder with the raw data files.
This is the folder you selected in the **File Output** dialog.
- 4 Prepare a separate storage device
This is typically a large capacity USB memory device or a harddisk. You can also connect the ES70 computer to a network, and copy the files to a server.
- 5 Use the functionality provided by the operating system to copy or move the files to the separate storage device.
- 6 Close the folder.

Views

These procedures explain how to control the presentations on the ES70 display.

Topics

- *How to change the size of the presentation fields* on page 79
- *How to select presentation layout* on page 79
- *How to change the colour scale and presentation palette* on page 80
- *How to change the number of colours in the echogram* on page 80

Related topics

- *About dynamic range and display presentation* on page 111
- *About range selection* on page 117

How to change the size of the presentation fields

You can modify the size of each individual field in the ES70 presentation. The content in a field that changes size will automatically adjust to take full advantage of the space available.

- 1 Move the cursor to the border line between two fields.
Observe that the marker changes form; it now appears as two parallel lines with arrows pointing out.
- 2 Click on the left mouse button, and keep it depressed.
- 3 Move the mouse – or roll the control wheel – and observe that the border line moves.
- 4 Release the mouse button when the border line has been moved to desired position.

How to select presentation layout

Your ES70 may be set up with one or more frequencies (channels). The **Layout** dialog and the **Taskbar** allows you to control which channels you can see on the display, and how they are presented.

- 1 Click the **Display** icon under the **Main** menu to open the **Display** menu.



→ *Display menu* on page 105

- 2 Click **Layout** to open the **Layout** dialog.

The **Layout** dialog lists all your active channels, You can enable or disable the presentation of individual channels.

- 3 In order to control the horizontal or vertical presentation when you have two or more echograms, use the buttons on the **Taskbar**.
 - **Horizontal** for a horizontal presentation
 - **Vertical** for a vertical presentation
 - **[Transducer name]** to see only the echogram for the chosen transducer

→ *Taskbar* on page 67

How to change the colour scale and presentation palette



By default you have 64 or 12 colours available to present the echograms, and a selection of palettes. The colour scale can be retrieved any time by clicking the **Colour Scale** icon on the **Title Bar**.

Which colour scale to use is defined in the **Colour Setup** dialog on the **Display** sub-menu.

This procedure explains how to change the colour scale and the presentation palette on the ES70 echograms.

- 1 Click the **Display** icon under the **Main** menu to open the **Display** menu.



→ *Display menu* on page 105

- 2 Click **Colour Setup** to open the **Colour Setup** dialog.



- 3 Select palette and echogram colours to suit your requirements
- 4 Click **OK** to save the current settings and close the dialog.

How to change the number of colours in the echogram



By default you have 64 or 12 colours available to present the echograms, and a selection of palettes. The colour scale can be retrieved any time by clicking the **Colour Scale** icon on the **Title Bar**.

Which colour scale to use is defined in the **Colour Setup** dialog on the **Display** sub-menu.

You can filter out the weakest echoes by manually modifying the colour threshold.

- 1 Click the **Colour Scale** icon on the **Title Bar** to open the **Colour Scale** information pane.
- 2 Move the cursor to the left side of the colour scale.
Observe that the cursor changes shape to a dual arrow line.

- 3 Click on the left edge of the colour scale, keep the mouse button depressed, and drag the edge towards right.
- 4 Observe that the weakest colours are removed from the colour scale, and thus also the weakest echoes from the echogram presentation.
- 5 Release the mouse button.
- 6 In order to restore the weakest colours, click on the left edge of the current colour scale, and drag towards left.

Echogram

These procedures explain the various parameters controlling the ES70 echogram.

Topics

- *How to change the ping rate* on page 81
- *How to select echogram presentation* on page 82
- *How to establish horizontal markers* on page 84
- *How to establish vertical markers* on page 85
- *How to select TVG gain in the Echogram dialog* on page 85
- *How to remove interference and vessel's own noise from the echograms* on page 86
- *How to easier identify the bottom contour* on page 87

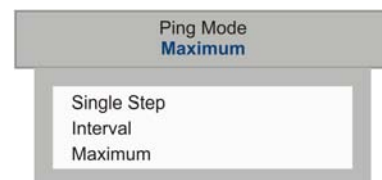
Related topics

- *About range selection* on page 117
- *About dynamic range and display presentation* on page 111
- *About bottom slopes* on page 115
- *About TVG gain* on page 109

How to change the ping rate

The “ping rate” is the parameter that controls how often the echo sounder shall transmit acoustic energy (a “ping”) into the water.

If you observe a pelagic echo on the ES70, and it seems to follow the bottom contour, it may in fact be a false echo from the previous transmission (“ping”). The only way to remove this false echo is to reduce the ping rate. If you do this, all the echoes from the previous ping will have disappeared before you transmit the next. On old paper based echo sounders the pen spent a long time on the rear side of the paper tray, and that reduced the ping rate. The ES70 is a lot faster, and you may send out a ping even before the energy from the previous ping has disappeared.



This procedure explains how to control how often the ES70 transmits acoustic energy into the water, that is “pinging”.

- 1 Click the **Operation** icon under the **Main** menu to open the **Operation** sub-menu.



→ *Operation menu* on page 104

- 2 Click **Ping**, and select *On*.



The two icons provided by this button can also be used to enable or disable transmission.

- The left icon (dark rectangle) is “Off”.
- The right icon is “On”. It is also used to initiate single pings when *Single Step* mode is selected.

- 3 How to choose maximum ping rate:

- a Click **Ping Mode**, and select *Maximum*.

This will make the ES70 ping with maximum speed. The time between each ping is automatically determined by a number of parameters, including the current depth, the pulse duration and the chosen range.

- 4 How to define a ping interval:

- a Click **Ping Mode**, and select *Interval*.
 - b Click **Ping Interval**, and select the time (in milliseconds) between each ping.



- 5 How to transmit single pings:

- a Click **Ping Mode**, and select *Single Step*.
 - b To transmit the single ping, click once on the right hand icon on the **Ping** button.

How to select echogram presentation

On the ES70 you can choose from several echogram presentations.

- a **Surface**

The echogram is related to the sea surface. Start depth (upper echogram boundary) and vertical range (across echogram) are manually selected by the **Start Depth** and **Range** buttons on the **Main** menu.

The biomass is automatically calculated based on choices you make in the **Calculation Interval** dialog; within a given time frame, a defined number of pings, or a portion of the echogram view. The data is then taken from an echo area starting immediately after the transmit pulse, and ending just over the detected depth. If you have limited your vertical range (using the **Range** and **Start Range** settings), the resulting area is used for the biomass calculation. If the seabed is clearly defined with a unique bottom detection, the bottom echo will not be included in the calculations. Therefore, if you switch the bottom detector off, the bottom echo will be included in the calculation.

→ *Biomass information pane* on page 59

b Bottom

The echogram is related to the detected bottom. Stop depth (lower echogram boundary) and vertical range are manually selected by the **Start Depth** and **Range** buttons on the **Main** menu. The echogram is only drawn for pings having a successful bottom detection.

The biomass calculation is made in the same way as for **Surface** echograms.

c Pelagic

This echogram is nearly identical to the **Surface** echogram. However, the biomass is calculated in a different manner.

The biomass calculations are not restricted by the bottom detection. This means that the bottom echo will be included in calculations if it appears within the chosen range.

Example 9 Biomass calculation

If you are investigating a large school of pelagic fish, set the **Start Range** and **Range** to enclose the school. If the school is large enough, a **Surface** echogram may mistake it for bottom, and the biomass readings will be wrong. The **Pelagic** echogram will however disregard the bottom detection, and give a correct estimate of the biomass.

d Trawl

This echogram covers the vertical opening of the trawl.

The echogram is only drawn when trawl position information is available.

The biomass calculation is made in the same way as for **Surface** echograms.

This procedure explains how to choose the echogram type you wish to see.

- 1 Click the **Active** icon under the **Main** menu to open the **Active** menu.



→ *Active menu* on page 107

- 2 Click **Echogram** to open the **Echogram** dialog.

- 3 On the **Echogram** tab, choose **Echogram Type**.

Note

*The chosen echogram type will only apply to the currently selected “active” echogram. If you wish the changes to apply to all similar echograms, click **Apply To All**.*

- 4 Click **OK** to save the current settings and close the dialog.

How to establish horizontal markers

The echograms provided by the ES70 may contain additional information. The following lines, markers and annotations can be enabled:

- *Bottom line* on page 54
- *White line* on page 54
- *Hardness line* on page 55
- *Trawl line* on page 55
- *Variable depth line* on page 56
- *Range other lines* on page 56
- *Biomass line* on page 57
- *Range scales* on page 57
- *Vertical ticks* on page 57
- *Annotations* on page 58

This procedure explains how you can enable one or more horizontal markers in the current echogram.

- 1 Click the **Active** icon under the **Main** menu to open the **Active** menu.



→ *Active menu* on page 107

- 2 Click **Echogram** to open the **Echogram** dialog.
- 3 On the **Lines** tab, observe the various markers that can be enabled.
- 4 Enable the lines you wish to see.

Note that the White Line and the Hardness Line can not be used simultaneously.

- 5 Click **OK** to save the current settings and close the dialog.

How to establish vertical markers

The echograms provided by the ES70 may contain additional information. The following lines, markers and annotations can be enabled:

- *Bottom line* on page 54
- *White line* on page 54
- *Hardness line* on page 55
- *Trawl line* on page 55
- *Variable depth line* on page 56
- *Range other lines* on page 56
- *Biomass line* on page 57
- *Range scales* on page 57
- *Vertical ticks* on page 57
- *Annotations* on page 58

This procedure explains how you can enable one or more vertical markers in the current echogram.

- 1 Click the **Active** icon under the **Main** menu to open the **Active** menu.



→ *Active menu* on page 107

- 2 Click **Echogram** to open the **Echogram** dialog.
- 3 On the **Lines** tab, observe the various vertical markers that can be enabled.

Note

*The annotations are controlled on the **Annotation** dialog, but to place the annotations in the echogram, you must enable them in the **Echogram** dialog.*

- 4 Enable the vertical markers you wish to see.
- 5 Click **OK** to save the current settings and close the dialog.

How to select TVG gain in the Echogram dialog

TVG means *Time Varied Gain*.

The whole idea with TVG is that echoes from fish shall have the same echo level (colour) independent of their depths.

The ES70 has a TVG range down to 15 000 meters, which for all practical purposes is unlimited. The ES70 does not have a TVG compensated receiver like most other echo sounders. In the ES70 the TVG is made in software after the echoes from the receiver(s) have been converted to digital format. In order to make this work the receiver must have very large dynamic range.

The TVG can be chosen using the **Echogram** dialog (described here), or with the **TVG** button on the **Active** menu.

→ *How to adjust the TVG gain on the Active menu* on page 96

- 1 Click the **Active** icon under the **Main** menu to open the **Active** menu.



→ *Active menu* on page 107

- 2 Click **Echogram** to open the **Echogram** dialog.
- 3 On the **Echogram** tab, observe the various TVG settings that can be applied.
→ *About TVG gain* on page 109
- 4 Choose your TVG setting.

Note that the changes made here will by default only be applied to the currently selected “active” echogram (identified with a thick border). If you wish to apply the changes to all the other echograms of the same type (for example all bottom related echograms), click **Apply To All**.

- 5 Click **OK** to save the current settings and close the dialog.

How to remove interference and vessel’s own noise from the echograms

The **Active** sub-menu offers a dedicated filter to remove interference and noise from your own vessel, the **Ping-Ping Filter**. This procedure explains how to activate this filter.

The following filter options are provided:

a Off

No filtering

b 2 of 3

For the current echo to be shown, the same echo must be present in at least two of the previous three pings.

c 2 of 2

For the current echo to be shown, the same echo must be present in both of the previous two pings.

d 3 of 3

For the current echo to be shown, the same echo must be present in three of the previous three pings.

This filter was originally developed for our sonars, but has also proven to be very useful in other hydroacoustic systems.



- 1 Click the **Active** icon under the **Main** menu to open the **Active** menu.



→ *Active menu* on page 107

- 2 Click **Ping-Ping Filter**, and make the adjustments to fit your requirements.

Note that the changes made here will by default only be applied to the currently selected “active” echogram (identified with a thick border). If you wish to apply the changes to all the other echograms of the same type (for example all bottom related echograms), click **Apply To All**.

How to easier identify the bottom contour

The **Echogram** dialog allows you to enable a *Bottom line* or a *White line* to easier identify the bottom. This procedure explains how to enable these features.

The marker lines enabled here are explained in section *Echograms* in chapter *Display view*.

→ *Lines, markers and annotations in the echograms* on page 54

- 1 Click the **Active** icon under the **Main** menu to open the **Active** menu.



→ *Active menu* on page 107

- 2 Click **Echogram** to open the **Echogram** dialog.
- 3 On the **Lines** tab, observe the various lines that can be applied.
- 4 Click **Bottom Line** to enable view.
- 5 Click either **Whiteline** or **Hardness** to select which line to show.
- 6 Click **OK** to save the current settings and close the dialog.

Ranges

These procedures explain how to change the vertical range, that is how to control the depth to be shown by the echogram.

Topics

- *How to choose the start depth on page 88*
- *How to choose an automatic start depth on page 89*
- *How to choose the vertical range on page 89*

Related topics

- *About range selection on page 117*
- *About bottom slopes on page 115*

How to choose the start depth

This procedure explains how to control the vertical start range (start depth) in the echogram. The start range is controlled by the **Start Range** button on the **Main** menu.



Example 10 Start Range in a surface related echogram

In a surface echogram, set the **Start Range** value to 0 meters. This will make the echogram start from the sea surface (provided that the transducer offset has been defined). Set **Range** to the current depth plus 20 meters. The echogram will now show the area from the sea surface and down to 20 meters “below” the bottom. The bottom contour is easily detected when the depth changes.

Three different methods may be used.

1 Method 1:

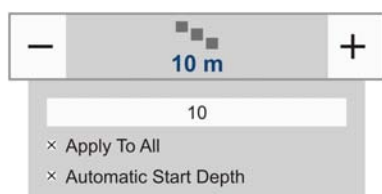
- Click [+] or [-] to adjust the start range manually.

2 Method 2:

- Click the middle of the button, hold the mouse button depressed, and drag sideways.

3 Method 3 can only be used if you have a keyboard:

- Click the middle of the button to open it.



- Enter any value from the keyboard.

How to choose an automatic start depth

This procedure explains how to enable use of the automatic start depth function. The start range is controlled by the **Start Range** button on the **Main** menu.



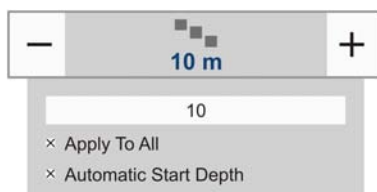
Note

*The **Automatic Start Depth** function will only work in surface related echograms.*

Example 11 Automatic Start Depth

If you set **Range** to 20 meters and enable the **Automatic Start Depth** feature, your echogram will always be drawn to make the bottom contour appear close to the bottom of your echogram presentation. If the water depth exceeds 20 meters, the ES70 will automatically move the start range down. The range is kept, but as the start range is moved, the bottom contour is still visible.

- 1 Observe the **Main** menu. It is normally located on the right hand side of the ES70 presentation.
- 2 Observe the **Start Range** button.
- 3 Click the middle of the button to open it.



- 4 Click to enable **Automatic Start Depth**.
- 5 Click the middle of the button to close it.

How to choose the vertical range

The vertical range is controlled by the **Range** button on the **Main** menu.



Example 12 Start Range and Range in bottom related echogram

In a bottom echogram, set the **Start Range** value to –5 meters. This will make the echogram start from 5 meters above the bottom. Set **Range** to the 5 meters plus 10 = 15 meters. The echogram will now show the area from 5 meters above the depth, and down to 10 meters “below” the bottom. The bottom contour will appear as a flat line.

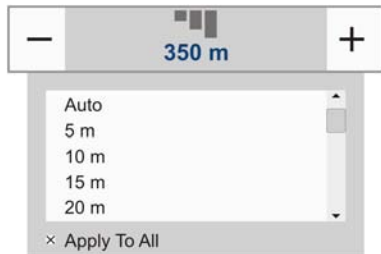
Two methods can be used.

1 Method 1:

- a Click [+] or [-] to adjust the range manually.

2 Method 2:

- a Click the middle of the button to open it.



- b Click any range value (including *Auto* when available) to select it.

Bottom detection

These procedures explain how you can control the bottom detection.

Topics

- *How to define maximum and minimum depth* on page 90
- *How to adjust the bottom detection to find flatfish* on page 91
- *How to adjust the bottom detection to find seagrass* on page 92

Related topics

- *About range selection* on page 117
- *About bottom slopes* on page 115

How to define maximum and minimum depth

When you use the ES70 it is very important that it detects and “locks” on the correct depth. Normally this will happen automatically. However, certain conditions (such as noise or air under the hull), or the appearance of large schools of fish, may “fool” the sounder. When the bottom is undetected you will read 0.00 meters depth.

In order to guide the ES70 to locate the correct depth, you may some times find it useful to follow this procedure.

Note

If you set maximum depth to a value identical or smaller than the minimum value, the bottom detection algorithm will be disabled. The ES70 will then not be able to detect the bottom at all, and the displayed depth will be 0.00m

- 1 Click the **Active** icon under the **Main** menu to open the **Active** menu.



→ *Active menu* on page 107

- 2 On the **Active** menu, click **Bottom Detector** to open the **Bottom Detector** dialog.



This dialog is used to define various parameters associated with the bottom detection. These include the depth range, where the ES70 searches for the bottom.

- 3 Enter a **Minimum Depth**.

This setting eliminates all unwanted bottom detections from the transducer surface and down to the defined depth.

- 4 Enter a **Maximum Depth**.

Set this depth to approximately 50% more than the expected depth. If the ES70 should lose bottom detection due to air or other disturbances, it will try to relocate the depth within the minimum and maximum depths you have defined. Do not exaggerate. If you for example enter 5000 meters and the bottom track is lost, the ES70 will search the entire depth for new bottom lock. This will take a lot of time.

- 5 Click **OK** to save the current settings and close the dialog.

How to adjust the bottom detection to find flatfish

The ES70 provides the **Bottom Backstep** parameter in the **Bottom Detector** dialog. You can use this parameter to enhance the detection of sole, flounder and similar species.

→ *About bottom slopes* on page 115

- 1 Click the **Active** icon under the **Main** menu to open the **Active** menu.



→ *Active menu* on page 107

- 2 On the **Active** menu, click **Bottom Detector** to open the **Bottom Detector** dialog.



This dialog is used to define various parameters associated with the bottom detection. These include the depth range, where the ES70 searches for the bottom.

- 3 Increase the **Bottom Backstep** level (make it more positive).

A typical setting would be approximately -30 dB, but you will need to experiment to find the best value for the operational frequency and the current bottom and sea conditions.

The ES70 will now provide increased penetration, and show you a detected bottom that is slightly deeper than the actual value. This will cause the flatfish to be shown as if they were located “above” the bottom.

- 4 Click **OK** to save the current settings and close the dialog.

How to adjust the bottom detection to find seagrass

The ES70 provides the **Bottom Backstep** parameter in the **Bottom Detector** dialog. If you have an Olex system, you can use this parameter to enhance the detection of seagrass.

→ *About bottom slopes* on page 115

- 1 Click the **Active** icon under the **Main** menu to open the **Active** menu.



→ *Active menu* on page 107

- 2 On the **Active** menu, click **Bottom Detector** to open the **Bottom Detector** dialog.



This dialog is used to define various parameters associated with the bottom detection. These include the depth range, where the ES70 searches for the bottom.

- 3 Decrease the **Bottom Backstep** level to a lower value (make it more negative).

A typical setting would be approximately -60 dB, but you will need to experiment to find the best value for the operational frequency and the current bottom and sea conditions.

The ES70 will now show you a depth value that is shallower than the actual depth.

- 4 Observe the true depth on the Olex system.

The difference between the two depths indicate the height of the seagrass.

- 5 Click **OK** to save the current settings and close the dialog.

Size distribution, biomass and fish density

If you use a “split beam” transducer on your ES70, it will provide you with information about the size distribution and density of the fish beneath the hull.

Topics

- *How to monitor the fish size distribution* on page 93
- *How to adjust the fish length for correct calculations* on page 94

- *How to monitor the current biomass* on page 94
- *How to enable the biomass line* on page 95

Related topics

- *About biomass* on page 108

How to monitor the fish size distribution

The size distribution is presented using the **Size Distribution** information pane.

→ *Size Distribution information pane* on page 62

- 1 Click the **Size Distribution** icon on the **Title Bar** to open the **Size Distribution** information pane.



- 2 To change the size of the information pane, click in the bottom right corner, hold the mouse button depressed, and drag.
- 3 To change the transparency of the information pane, open the **Display** menu, and click the **Transparency** button.



- 4 Click on the histogram titles to see the information from the different echograms.
- 5 To change the presentation parameters:
 - a Click the tool button in the top right corner of the information pane to open the **Size Distribution** dialog.
The dialog can also be opened from the **Active** menu.
 - b Make the necessary adjustments.
 - c Click **OK** to save the current settings and close the dialog.
- 6 To change the fish species:
 - a Click the **Setup** icon under the **Main** menu to open the **Setup** menu.



→ *Setup menu* on page 106

- b Click **Fish Select** to open the **Fish Select** dialog.



- c Make the necessary adjustments.
- d Click **OK** to save the current settings and close the dialog.

How to adjust the fish length for correct calculations

The ES70 measures and records the target strength (TS). The researchers at the Norwegian Institute for Fishery Research have compiled a set of algorithms based on extensive testing with the various species, and these are used by the ES70 to calculate the length of the fish based on its target strength. However, the target strength differs between the various species. If you find out that the length of the fish you have caught differs from the initial presentation, you can adjust the algorithms used to calculate the length.

Note

Pay special attention to mackerel, as this fish has a very low target strength. Mackerel can often be mistaken for small bait. If you fish for mackerel, we recommend that you use 120 kHz or 200 kHz echo sounder frequencies, as the mackerel shows largest echo strength for these frequencies.

- 1 Click the **Setup** icon under the **Main** menu to open the **Setup** menu.



→ *Setup menu* on page 106

- 2 Click **Fish Select** to open the **Fish Select** dialog.



- 3 Make the necessary adjustments.
- 4 Click **OK** to save the current settings and close the dialog.

How to monitor the current biomass

The biomass is presented using the **Biomass** information pane, and/or enabling the **Biomass line** in the echogram presentation.

→ *Biomass information pane* on page 59

→ *Lines, markers and annotations in the echograms* on page 54

This procedure explains how to open the **Biomass** information pane.

- 1 Click the **Biomass** icon on the **Title Bar** to open the **Biomass** information pane.



- 2 To change the size of the information pane, click in the bottom right corner, hold the mouse button depressed, and drag.
- 3 To change the transparency of the information pane, open the **Display** menu, and click the **Transparency** button.



- 4 Click on the histogram titles to see the presentations from the different echograms.

How to enable the biomass line

The biomass is presented using the **Biomass** information pane, and/or enabling the **Biomass line** in the echogram presentation.

- *Biomass information pane* on page 59
- *Lines, markers and annotations in the echograms* on page 54

This procedure explains how to enable the **Biomass line**.

- 1 Click the **Active** icon under the **Main** menu to open the **Active** menu.



- *Active menu* on page 107

- 2 Click **Echogram** to open the **Echogram** dialog.
- 3 On the **Lines** tab, observe that the biomass can be enabled or disabled, and that you can define a scale for it.
- 4 Make the necessary adjustments.
- 5 Click **OK** to save the current settings and close the dialog.

Gain

These procedures explain how you can adjust the gain in the ES70. This controls how “powerful” the echoes are shown in the echogram. The ES70 uses two principles for gain; *signal amplification* and *time varied gain (TVG)*.

Topics

- *How to adjust the signal gain* on page 95
- *How to adjust the TVG gain on the Active menu* on page 96

Related topics

- *About TVG gain* on page 109
- *About dynamic range and display presentation* on page 111

How to adjust the signal gain

This procedure explains how to change the signal amplification.

- 1 Observe the **Main** menu. It is normally located on the right hand side of the ES70 presentation.

- 2 Observe the **Gain** button on the **Main** menu.



- 3 **Method 1:**

a Click [+] or [-] to choose gain.

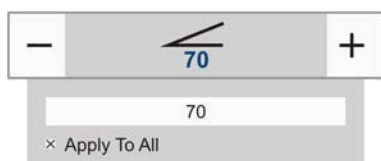
- 4 **Method 2:**

a Click the middle of the **Gain** button, hold the mouse button depressed.

b Drag the cursor left or right to increase or decrease the gain.

- 5 **Method 3** can only be used if you have a keyboard:

a Click the middle of the **Gain** button to open the sub-menu.



b Enter the requested gain value between 20 and 120.

How to adjust the TVG gain on the Active menu

TVG means *Time Varied Gain*.

The whole idea with TVG is that echoes from fish shall have the same echo level (colour) independent of their depths.

The ES70 has a TVG range down to 15 000 meters, which for all practical purposes is unlimited. The ES70 does not have a TVG compensated receiver like most other echo sounders. In the ES70 the TVG is made in software after the echoes from the receiver(s) have been converted to digital format. In order to make this work the receiver must have very large dynamic range.

The TVG can be chosen using the **Echogram** dialog, or with the **TVG** button on the **Active** sub-menu. This second method is described in this procedure.

→ *How to select TVG gain in the Echogram dialog on page 85*

- 1 Click the **Active** icon under the **Main** menu to open the **Active** menu.



→ *Active menu on page 107*

- 2 Locate the **TVG** button.



- 3 **Method 1:**

a Click [+] or [-] to choose TVG setting.

4 Method 2:

- a Click the middle of the **TVG** button to open the sub-menu.



- b Click on any TVG setting to select it.

Power and pulse duration

These procedures explain how to control the output power and transmission pulse duration.

Topics

- *How to choose passive mode* on page 97
- *How to change the output power* on page 98
- *How to adjust the pulse duration* on page 98

Related topics

- *About output power* on page 112
- *About pulse duration* on page 113

How to choose passive mode

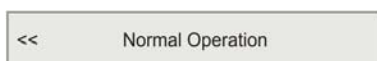
In order to check how much noise the ES70 is receiving, set it to passive mode. This means that the ES70 is not transmitting sound pulses into the water, it is only “listening”.

- 1 Click the **Operation** icon under the **Main** menu to open the **Operation** sub-menu.



→ *Operation menu* on page 104

- 2 Click **Normal Operation** to open the **Normal Operation** dialog.



This dialog is used to define various parameters associated with the transceiver. These settings include transceiver mode, the depth of the transducer surface, the transmit power, and the pulse duration. Note that this dialog is not available in *Replay* mode.

- 3 For the relevant transducer channel, set **Mode** to *Passive*.
- 4 Click **OK** to save the current settings and close the dialog.

How to change the output power

From time to time it may be useful to reduce the output power. A reduced power output may prove beneficial if you are looking for single fishes or schools near the surface, if you work in very shallow waters, if you are bothered with false echoes due to reverberation, or if you simply feel that the echoes are too strong.

Note

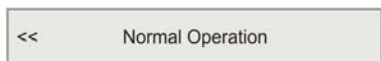
If you increase the output power, make sure that you do not choose more power than your transducer can handle. With a correct setup with the transducer registered in the echo sounder software you are safeguarded against this. However, if you use a third party transducer that is not known by the echo sounder software, you may inflict permanent damage if you increase the output to beyond the transducer's capabilities.

- 1 Click the **Operation** icon under the **Main** menu to open the **Operation** sub-menu.



→ *Operation menu* on page 104

- 2 Click **Normal Operation** to open the **Normal Operation** dialog.



This dialog is used to define various parameters associated with the transceiver. These settings include transceiver mode, the depth of the transducer surface, the transmit power, and the pulse duration. Note that this dialog is not available in *Replay* mode.

- 3 For the relevant transducer channel, set **Power [W]** to requested value.
→ *About output power* on page 112
- 4 Click **OK** to save the current settings and close the dialog.

How to adjust the pulse duration

The length of your transmitted pulse is very important to how you can detect fish.

- A short pulse duration gives you a very fine vertical resolution. This allows you to detect scattered fish, and you can find those that move near the bottom.
- A long pulse duration throws a lot more energy into the water, and the digital filters used by the receiver are narrower.

These filters will reduce the ES70's sensitivity for noise, but the length of the transmitted pulse will give you stronger echoes. With the filters, a longer pulse duration will provide longer range, but reduced vertical resolution.

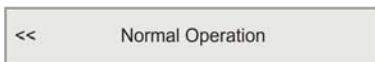
This procedure explains how to change the pulse length (duration).

- 1 Click the **Operation** icon under the **Main** menu to open the **Operation** sub-menu.



→ *Operation menu* on page 104

- 2 Click **Normal Operation** to open the **Normal Operation** dialog.



This dialog is used to define various parameters associated with the transceiver. These settings include transceiver mode, the depth of the transducer surface, the transmit power, and the pulse duration. Note that this dialog is not available in *Replay* mode.

- 3 For the relevant transducer channel, set **Pulse Length** to requested value.

For general use, we recommend that the pulse duration is set to *Auto*.

→ *About pulse duration* on page 113

- 4 Click **OK** to save the current settings and close the dialog.

The menu system

Menu navigation employed by the ES70 is similar to the other Simrad applications which follow the new user interface standards developed by Simrad.

The main menu is by default located at the right side of the screen. By means of dedicated icons at the bottom of the main menu, you can open and close the relevant sub-menus. Menu choices shown in dark colours are not available for the current operation or operational mode.

Topics

- *About menus and buttons* on page 100
- *Main menu* on page 103
- *Operation menu* on page 104
- *Display menu* on page 105
- *Setup menu* on page 106

About menus and buttons

The selection of operational parameters on the ES70 is done using a tree structure with a main menu, a set of secondary menus, and several menu buttons. Some of the menu buttons open dialogs or miniature menus to provide additional parameters.

The text in the buttons can be changed to suit your preference using the **Language** button on the **Display** sub-menu.

→ *How to select menu language* on page 73

- 1 The **Main** menu provides the parameters most frequently used during normal operation.
- 2 The **Operation** menu controls the main operational parameters.
- 3 The **Display** menu controls the visual aspects of the system, such as parameters related to the display presentation.
- 4 The **Setup** menu allows you to control the configuration of the signal processing, as well as system installation and maintenance, and the interfaces to peripheral devices.
- 5 The **Active** menu has its content linked to the current active item (view or object). Use it to access special features available for the selected item.

Figure 35 Sub-menu icons



From left:

- **Operation** menu
- **Display** menu
- **Setup** menu
- **Active** menu

Button types

Each menu contains several menu buttons. Each button shows the function of the button, some of them also display the current parameter setting. The majority of the buttons in each menu provide one or more of these functions:

- You can increase and decrease parameter values by clicking the [+] and [–] fields on the button.
- You can change parameter values by clicking on the button, holding the mouse depressed, and then moving the cursor sideways.
- You can change parameter values by means of the scroll wheel on the mouse or trackball.
- You can enter parameter values from the keyboard (if you have one).
- You can select parameter value from the button's sub-menu.
- You can open a dedicated dialog.

How to select a numerical parameter using the +/- buttons



- 1 Move the cursor to either side of the button, and observe that the background colour changes.
 - a Click on the left side of the button to decrease the numerical value.
 - b Click on the right side of the button to increase the numerical value.

How to select a numerical parameter by moving the cursor horizontally



- 1 Place the cursor on the middle of the button.
- 2 Click and hold the left mouse button depressed.
- 3 Move the cursor horizontally: left to decrease the parameter value, or right to increase it.

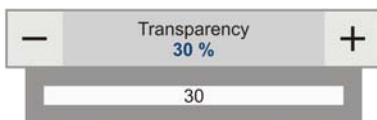
- 4 Release the mouse button when the requested value is shown.

How to select a numerical parameter by means of the scroll wheel



- 1 Place the cursor on the middle of the button.
- 2 Spin the scroll wheel in either direction to increase or decrease the parameter value.
- 3 Release the scroll wheel when the requested value is shown.

How to select a numerical parameter using the keyboard



- 1 Click the middle section of the button to open a text field.
- 2 Enter the numerical value into the text field.
If the numerical value exceeds the permitted range for the parameter, the frame in the text field will be red. You will then not be able to enter the value.
- 3 Press the **Enter** key.

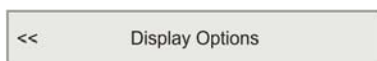
How to select a parameter using a sub-menu



- 1 Click the middle section of the button to open a sub-menu, then click the requested parameter value.
The chosen value is applied, and the sub-menu is automatically closed.
- 2 Whenever applicable, you can also access the sub-menu by clicking the left and right side of the button, but this method will not show you the menu choices.
 - a Click on the left side of the button to select a lower sub-menu choice.
 - b Click on the right side of the button to select a higher sub-menu choice.

How to select parameters using a dialog

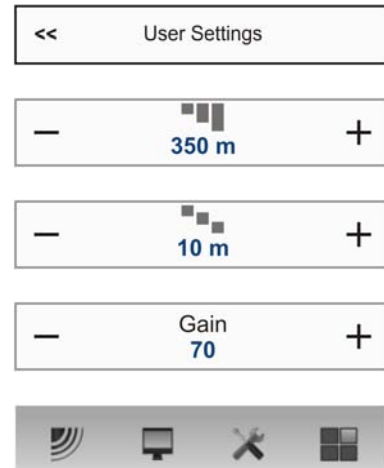
- 1 Click anywhere on the button to open a separate dialog.



Main menu

The following functions and parameters are available from the **Main** menu.

- 1 The **User Settings** dialog allows you to save the current user settings (parameter selections), and to retrieve previously saved factory or user settings.
- 2 The **Range** function allows you to specify the vertical range of the water column covered by the echogram. The range is defined from a selected start range, and down to a value beneath the current bottom depth. The value shown and selected is by default applied only to the currently selected echogram.
- 3 The **Start Range** function allows you to specify the start depth of the echogram, that is from which depth in the water column the presentation shall start. The value shown and selected is applied to the currently selected echogram type. In a surface related echogram, you can click **Automatic Start Depth** to allow the ES70 to select the start range automatically.
- 4 The purpose of the **Gain** function is to adjust the echo level in the echogram presentations.



The bottom of the **Main** menu holds the icons for the sub-menus. Click on one of these icons to open the requested sub-menu.

Menu button

On the **Title bar**, click once on the **Menu** button to hide the menu.



Click one more time to bring the menu back again.

When the menu is hidden, it will temporarily be shown on the left and right hand side of the display if you move the cursor to that position.

For detailed information about every function, button and dialog, refer to the *ES70 Reference manual* or to the context sensitive on-line help.

Operation menu

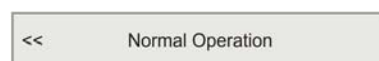


The following functions and parameters are available from the **Operation** menu.

Click once on the icon under the **Main** menu to open the **Operation** menu.

Click one more time on the icon to close the menu.

- 1 The purpose of the **Operation** function is to control the operational mode of the ES70. You can set it to *Normal*, *Replay* or *Inactive*.
- 2 The purpose of the **Ping** function is to enable or disable the ES70 audio transmissions into the water (“pinging”).
- 3 The **Ping Mode** function is used to control how often the ES70 shall transmits its energy into the water.
- 4 Use the **Ping Interval** function to choose the time (in milliseconds) between each transmission (ping) when **Ping Mode** is set to *Interval*.
- 5 The purpose of the **Normal Operation** dialog is to provide an overview of the current transceiver parameters, and to provide you with the ability to change them.
- 6 The **Record** function allows you to record the unprocessed transducer signals, and save them on the internal hard disk. The files can later be copied or moved to other recordable media.



For detailed information about every function, button and dialog, refer to the *ES70 Reference manual* or to the context sensitive on-line help.

Display menu



The following functions and parameters are available from the **Display** menu.

Click once on the icon under the **Main** menu to open the **Display** menu. Click one more time on the icon to close the menu.

- 1 The purpose of the **Colour Setup** dialog is to control the presentation colours used by the ES70.
- 2 The purpose of the **Screen Brightness** function is to adjust the intensity of the light given off by the display.
- 3 The purpose of the **Units** dialog is to control the unit of measurements used by the ES70.
- 4 The purpose of the **Transparency** function is to adjust how much you are able to see through the information panes.
- 5 The purpose of the **Language** function is to select the language to be used on the menus.
- 6 The purpose of the **Layout** dialog is to arrange the location of the echograms on the presentation, or to temporarily hide any of them.
- 7 The purpose of the **Display Options** dialog is to control the location of the menu, and which information to be provided on the **Title Bar** and the **Taskbar**. It also controls which tooltips to display.
- 8 The purpose of the **About** dialog is provide you with the current ES70 software version.



For detailed information about every function, button and dialog, refer to the *ES70 Reference manual* or to the context sensitive on-line help.

Setup menu



The following functions and parameters are available from the **Setup** menu.

Click once on the icon under the **Main** menu to open the **Setup** menu. Click one more time on the icon to close the menu.

- | | |
|---|--|
| <ol style="list-style-type: none"> 1 The purpose of the Synchronization dialog is to set up the ES70 to operate alone, or as a master or slave in a synchronized system. Synchronization is required in order to avoid interference if the ES70 is used simultaneously with other hydroacoustic instruments within the same frequency range. 2 The purpose of the Annotations dialog is to allow you to enter comments and annotations into the echograms. 3 The parameters in the Fish Select dialog allows you to select the fish species, and to modify the fish size distribution manually. 4 The Calculation Interval dialog allows you to define the time, number of pings, or part of the echogram view used to calculate the biomass and the size distribution. 5 The Navigation dialog controls how the ES70 receives information from external peripherals, such as navigation and compass gyro systems. 6 The Trawl dialog allows you to enter the main parameters related to the trawl. Trawl information is used for display of upper and lower trawl line in the echogram. All received speed data are stored to file when recording of raw data to file is enabled. 7 The purpose of the Ethernet Output dialog is to define the communication parameters for the EK500 datagram output on the Ethernet port. 8 The Depth Output dialog is used to set up the output of depth data from the ES70 to a dedicated communication port on a specified format. 9 The Installation button opens a sub-menu with four choices. You can modify the environmental parameters, set up the inputs and outputs from peripheral devices, set up the transceiver and transducer connections, and administrate the software licenses. | <div style="border: 1px solid #ccc; background-color: #f0f0f0; padding: 5px; margin-bottom: 5px; display: flex; justify-content: space-between;"><<Synchronization</div> <div style="border: 1px solid #ccc; background-color: #f0f0f0; padding: 5px; margin-bottom: 5px; display: flex; justify-content: space-between;"><<Annotations</div> <div style="border: 1px solid #ccc; background-color: #f0f0f0; padding: 5px; margin-bottom: 5px; display: flex; justify-content: space-between;"><<Fish Select</div> <div style="border: 1px solid #ccc; background-color: #f0f0f0; padding: 5px; margin-bottom: 5px; display: flex; justify-content: space-between;"><<Navigation</div> <div style="border: 1px solid #ccc; background-color: #f0f0f0; padding: 5px; margin-bottom: 5px; display: flex; justify-content: space-between;"><<Calculation Interval</div> <div style="border: 1px solid #ccc; background-color: #f0f0f0; padding: 5px; margin-bottom: 5px; display: flex; justify-content: space-between;"><<Trawl</div> <div style="border: 1px solid #ccc; background-color: #f0f0f0; padding: 5px; margin-bottom: 5px; display: flex; justify-content: space-between;"><<Ethernet Output</div> <div style="border: 1px solid #ccc; background-color: #f0f0f0; padding: 5px; margin-bottom: 5px; display: flex; justify-content: space-between;"><<Depth Output</div> <div style="border: 1px solid #ccc; background-color: #f0f0f0; padding: 5px; display: flex; justify-content: space-between;">Installation</div> |
|---|--|

For detailed information about every function, button and dialog, refer to the *ES70 Reference manual* or to the context sensitive on-line help.

Active menu



The following functions and parameters are available from the **Active** menu.

Click once on the icon under the **Main** menu to open the **Active** menu. Click one more time on the icon to close the menu.

- 1 The **Echogram** dialog allows you to set up the parameters controlling the echogram presentation. The three tabs control the horizontal lines, the echogram type with applied TVG, and how fast the echogram moves across the display.

<< Echogram
- 2 The purpose of the **TVG** button is to allow you to change the TVG curve for the received echoes.

— TVG School +
- 3 The **Ping-Ping Filter** removes unwanted noise and echoes from the echogram presentation.

— Ping-Ping Filter Off +
- 4 The **Bottom Gain** setting controls the gain below the detected bottom depth.

— Bottom Gain 5 +
- 5 The **Size Distribution** dialog allows you to set up the parameters for the histogram presented in the Size Distribution information pane.

<< Size Distribution
- 6 The purpose of the **Bottom Detector** dialog is used to define the upper and lower depth limits most likely to be used during the ES70 operation. In this dialog, you can also modify the setting for **Bottom Backstep** to change the bottom detection relative to the bottom echo.

<< Bottom Detector

For detailed information about every function, button and dialog, refer to the *ES70 Reference manual* or to the context sensitive on-line help.

Echo sounder theory

When you use an echo sounder there are some basic knowledge that you may find it useful to possess.

Topics

- *About biomass* on page 108
- *About TVG gain* on page 109
- *About dynamic range and display presentation* on page 111
- *About output power* on page 112
- *About pulse duration* on page 113
- *About bottom slopes* on page 115
- *About range selection* on page 117

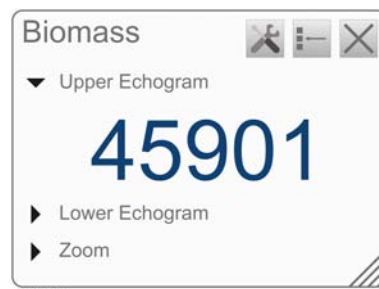
About biomass

Provided that you use an ES70 with a split beam transducer, or have a valid biomass license on a single beam transceiver, you will have access to the **Biomass** information pane.

This biomass value is an indicator to how much fish you currently have in the current echogram, or in the zoomed area. Every single fish will emit an echo, and the sum of all these registered echoes are presented as a number. Smaller organisms such as plankton will also emit echoes, but these are so weak that they will hardly influence on the total biomass.

ES70 records all the targets from the smallest plankton to the largest whale, and provides these findings as a number. For all practical purposes this number will provide you with information about the fish abundance to allow you to decide if it pays off to start fishing. You must also consider if this number is a result of large amounts of plankton or bait, or

Figure 36 Biomass information pane



if there is real fish below the keel. The number provided to display fish abundance is relative, and after some use your experience will be a valuable factor when the decision is made.

The biomass value is also used by the researches to calculate how much fish there is in the ocean. If you know the fish specie and the size of the fish, you can calculate number of individual fishes for a given volume of sea. Other means to establish the final result are trawling and catch data from the fishery community.

Note

If you have other echo sounders or sonars running asynchronous with the ES70, the ES70 will also measure the transmit pulse from the secondary system. This is called interference.

*You can remove the interference using the **Ping-Ping Filter** function on the **Active** menu, but the ES70 receiver will still pick up the transmit pulse and implement it in the calculations.*

A full synchronization of the various acoustic instruments is required. If your own vessel produces excessive noise this will also be taken into the biomass calculations and provide you with inaccurate information.

Related topics

- *Biomass line* on page 57
- *Biomass information pane* on page 59

About TVG gain

TVG means *Time Varied Gain*. When TVG is used in an echo sounder, we also some times refer to it as *depth variable gain*.

The purpose of the TVG functionality is to make all fishes appear with the same echo colour independent of their different depths.

In more technical terms, time varied gain (TVG) is a signal compensation. When the acoustic signal is transmitted from the echo sounder transducer, it is subjected to loss due to *absorption* and *spreading*. First, depending on the current salinity and temperature, the water will absorb some of the energy from the transmission. The absorption loss increases as the range increases. Second, the energy will spread out to form a circular beam. The width of this beam also increases with the range. Both absorption and spreading will thus reduce the energy, and both will also have an effect on the returned echo signal. The TVG compensation is designed to counteract these natural phenomena, and this is done in the ES70 using digital signal processing. The desired result is that fish of the same size return echoes of the same strength (colour), regardless of range.



You can adjust the TVG setting using the **Echogram** or **TVG** functions. Both are located on the **Active** menu.

Because the strength of the echoes will become weaker with increasing depth, the echo sounder will automatically amplify the deepest echoes more than the shallower echoes. In fact, the gain will increase proportional to how long the echo sounder “waits” for the echoes. When you choose the TVG setting you can either switch it off (which we do NOT recommend), or you can choose settings **20 log R** or **40 log R**.

The various settings control the gain algorithms, how much gain to be applied when the depth increases. When you choose the **40 log R** setting, the gain will increase with the depth more rapidly than if you choose the **20 log R** setting. This is simply because individual fishes emit smaller echoes than a school, and this makes them more difficult to detect. In the equation the character **R** means “Range”.

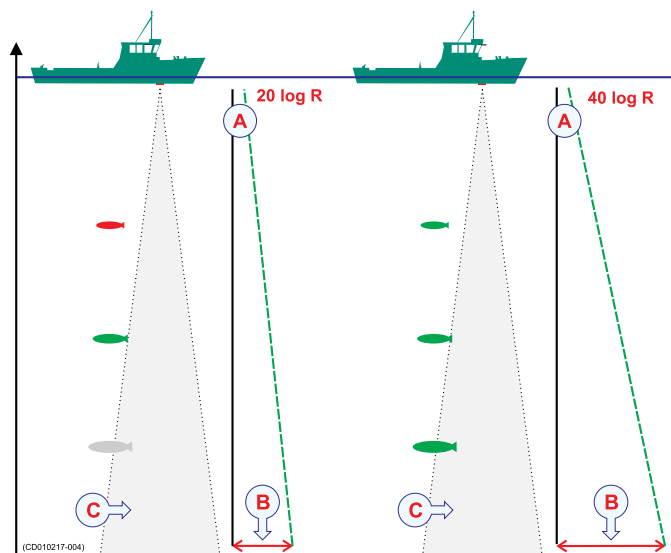
The illustration shows how the gain close to the bottom (B) is larger than just below the transducer (A). The echoes from the fish close to the bottom will then be shown with the same strength (colour) as echoes from pelagic fish.

The left vessel uses the **20 log R** setting. Due to the increasing beam width (C), single fishes are shown larger and larger with increasing depth, even though they may be of identical size.

The right vessel uses the **40 log R** setting. The size of the fish will still appear to grow larger as the range increases, but the echo is compensated differently to offer a more uniform echo strength (colour in the echogram).

When you are looking for schools these will fill the entire beam, just as the bottom normally does. A lot of gain is then not necessary. The **20 log R** setting will provide an acceptable echo strength.

Figure 37 TVG principle



About dynamic range and display presentation

The ES70 echo sounder has a dynamic range of 140 dB. This means that the sounder can receive both very strong and very weak echoes. Actually, the ES70 will detect echoes from plankton to whales, bottom on most depths, and present the information free from distortion. As a comparison, our old echo sounders ES380 and ET100 had - using analogue TVG - a dynamic range corresponding to approximately 65 dB.

Naturally, we can not present all these echoes on the display simultaneously, as this would create a mess of colours.

When 12 colours are used, we create a 36 dB section and give each colour a 3 dB strength. Every colour (3 dB) then represents a doubling of the echo strength. With 12 colours in use this will be a 36 dB colour range from grey to brown. Grey is used for the weakest echoes, while the strongest echoes are brown. All echoes stronger than brown will still be brown, while echoes weaker than grey will not be shown.

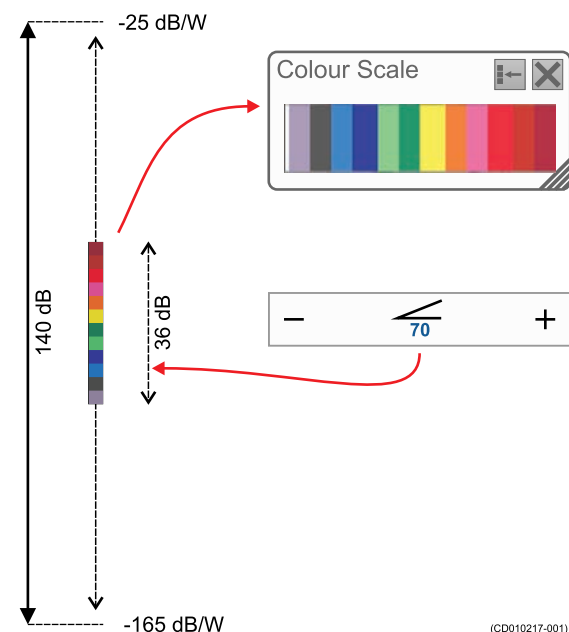
With 64 colours in use, each colour represents approximately 0,5 dB echo strength.

The old paper sounders had a dynamic range of 12 dB in their printouts using the “colours” from light grey to black. The dynamic range in the ES70 colour presentation is thus a lot larger; 24 dB or 250 times.

Along the dynamic range we take the 36 dB section and “moves it” up and down with the settings in the **Gain** button on the **Main** menu.

Use the **Colour Scale** information pane to monitor the colours in current use. To change the colour scale, use the **Colour Setup** function on the **Display** menu.

Figure 38 Dynamic range in ES70



(CD010217-001)

Related topics

- *Colour Scale information pane* on page 60

About output power

The echo sounder's transducer converts the electrical input power to a sound transmitted into the water. In the majority of the transducers manufactured by Simrad the transducer's *power efficiency* is between 50 and 75%. This means that between 50 and 75% of the input power is transmitted as sound. Transducers from other manufacturers may have as low as 5% power efficiency. Naturally, it is very important that you check this parameter when you wish to purchase a transducer.

The echo sounder's *output power* is a measurement on how much electrical energy the amplifier can send down to the transducer. The maximum power is limited by the transducer you have, and how much power it may accept from the transmitter for conversion to acoustic energy. If you send too much power into the transducer, you may inflict permanent and unrepairable damage.

The *source level (SL)* is a measurement on how much acoustic energy that is in fact sent out by the transducer, how high "volume" it will emit. The source level is measured as "sound pressure" one meter below the transducer face, and it is given i *dB re. 1μPa at 1 m*.

In order to know how much power you can use you must know what kind of transducer you are using. Provided that the echo sounder has been installed with a Simrad transducer, and you know what type it is, this is no problem. All necessary parameters about the transducer are then known by the echo sounder, and the software in the sounder will ensure that you do not output too much power. If you use a third party transducer you must manually check that the output power from the Simrad ES70 does not exceed the power rating.

Note

If you send too much power into the transducer it will – just like a loudspeaker – be damaged beyond repair.

If the transducer receives too much power from the echo sounder, it will also *cavitate*. This is a physical phenomenon causing the appearance of gas bubbles immediately below the transducer face. When this happens hardly any energy is sent into the water, and the transducer face is subject to physical damage. The cavitation depends on the power applied, the physical size of the transducer face, how deep the transducer is mounted, and the amount of contamination (air and particles) under the transducer face. Transducers with a large face can accept more power.

Near sea level, minute bubbles of micron or submicron size are always present in the ocean. When the rarefaction tension phase of an acoustic wave is great enough, the medium ruptures or "cavitates". For sound sources near the sea surface, the ever-present cavitation nuclei permit rupture to occur at pressure swings of the order of 1 atm (0.1 MPa), depending on the frequency, duration, and repetition rate of the sound pulse. Cavitation bubbles may also be produced by Bernoulli pressure drops associated with the tips of high-speed underwater propellers. Natural cavitation is created by photosynthesis.

Several extraordinary physical phenomena are associated with acoustic cavitation. Chemical reactions can be initiated or increased in activity; living cells and macromolecules can be ruptured; violently oscillating bubbles close to a solid surface can erode the toughest of metals or plastics; light may be produced by cavitation (sonoluminescence). The high pressures and high temperatures (calculated to be 30,000° Kelvin) at the interior during the collapsing phase of cavitating single bubbles can cause emission of a reproducible pulse of light of duration less than 50 picoseconds.

Of direct importance to the use of sound sources at sea is the fact that, as the sound pressure amplitude increases, ambient bubbles begin to oscillate nonlinearly, and harmonics are generated. At sea level, the amplitude of the second harmonic is less than 1 percent of the fundamental as long as the pressure amplitude of the fundamental of a CW wave is less than about 0.01 atm rms (1 kPa) (Rusby 1970). This increases to about 5 percent harmonic distortion when the signal is about 10 kPa.

When the peak pressure amplitude is somewhat greater than 1 atm, the absolute pressure for a sound source at sea level will be less than zero during the rarefaction part of the cycle. In using CW below 10 kHz, this negative pressure, or tension, is the trigger for a sharply increased level of harmonic distortion and the issuance of broadband noise. Any attempt to increase the sound pressure amplitude appreciably beyond the ambient pressure will cause not only total distortion but also the generation of a large cloud of bubbles which will actually decrease the far-field acoustic pressure.

The detailed bubble activities during cavitation have been studied in several laboratories. Acousticians have identified gaseous cavitation resulting in streamers of hissing bubbles that jet away from regions of high acoustic pressure swings, and vaporous cavitation, which radiates shock waves of broadband noise.

— *Herman Medwin & Clarence S. Clay (1998)*^[5]

In order to control the power output on the Simrad ES70, use the **Normal Operation** function on the **Operation** menu.

Related topics

- *How to choose passive mode* on page 97
- *How to change the output power* on page 98
- *How to adjust the pulse duration* on page 98

About pulse duration

The echo sounder's *pulse duration* is a measurement for how long the acoustic pulse lasts.

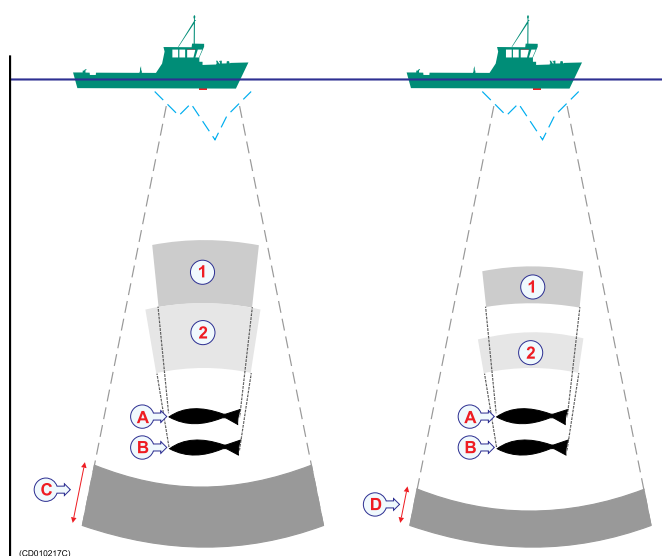
5. from “Fundamentals of Acoustical Oceanography”, Academic Press, San Diego, 1998

The pulse duration can be adjusted according to the current depth and what kind of fish you are looking for. The deeper you wish to see, the longer pulse duration should be used. Remember that in ES70 echo sounder, the pulse duration and the bandwidth is mutually dependant.

- Long pulse - lots of acoustic energy - narrow bandwidth - less sensitive for noise from own vessel and environment
- Short pulse - less acoustic energy - wide bandwidth - more sensitive for noise from own vessel and environment

A pulse duration of 1 mS covers 1,5 meters in the water, and this corresponds to a target separation of approximately 75 cm. This is a typical pulse duration that you may well use down to 250 to 300 meters. If you work in deeper waters use a longer pulse duration, if it is shallower, use a shorter pulse duration. Try out different values, and seek out the pulse duration that provides you with the clearest echo presentation with minimum noise, but with maximum fish detection and separation.

Figure 39 Pulse duration principles



The left vessel uses a long pulse duration (C). As you can see, this causes the echoes from the two fishes (A) and (B) to merge. The right vessel uses a shorter pulse duration, and the two fishes will then appear as two separate echoes on the echogram. Thus, short pulses will provide the best resolution and separation of individual fishes, but the echo sounder is more sensitive to noise.

The speed of sound in water is approximately 1500 m/s. The length of a 1 mS sound pulse will thus be approximately 1,5 meter. With the echo sounder you can then adjust the sound pulse from 7,5 cm (0.05 mS) to 24 m (16 mS) depending of the operational frequency. This is an important factor for the appearance of single fishes.

- When the vertical distance between two fishes, or the distance between a fish and the bottom, is more than the distance covered by a half pulse duration, the echoes will be presented as two separate echoes. The fish above the bottom will be identified.
- If the distance between two individual fishes, or the distance between a single fish and the bottom, is less than the distance covered by a half pulse duration, the echo will be presented as one echo. The echo from the fish close to the bottom will be merged with the bottom echo.

All operational frequencies have different pulse durations. The difference between for example a 50 kHz and a 38 kHz transducer is however not large:

- A 50 kHz transducer can be used with pulse durations from 0,12 mS to 2 mS
- A 38 kHz transducer can be used with pulse durations from 0,26 mS to 4 mS.

Basically, both these frequencies will provide you with the same detection ability. A 50 kHz transducer may provide better resolution in shallow waters, while the 38 kHz transducer may provide longer range on deeper waters. On the 38 kHz transducer the shortest pulse duration is 0,26 mS. This results in a 40 cm sound pulse and a 20 cm fish separation.

In order to control the pulse duration on the Simrad ES70, use the **Normal Operation** function on the **Operation** menu.

Related topics

- *How to adjust the pulse duration* on page 98

About bottom slopes

“Bottom slopes” is a well known phenomenon with echo sounders. This happens when the bottom rises suddenly, and the start edge of the transducer beam detects the bottom before the opposite edge.

One method for minimizing the “bottom slopes” phenomenon is to use a transducer with narrow beam, or to increase the pulse duration.

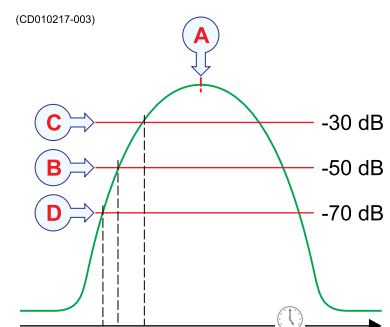
Another way to minimize this phenomenon is to open the **Bottom Detector** dialog, and then change the setting for **Bottom Backstep**. This function can also be put to other use.

- A** *The peak of the bottom pulse*
- B** *Default bottom backstep level*
- C** *Approximate bottom backstep level for flatfish detection*
- D** *Approximate bottom backstep level for seagrass detection*

The bottom pulse basically identifies the bottom depth just prior to the peak of the pulse (A). However, this may not be the true bottom. For example, if the bottom pulse is generated by a rock bottom under a thick layer of mud, the actual depth is slightly shallower. For this reason, the ES70 is by default set up to give you a depth reading a few milliseconds before the peak of the pulse. This is done by setting the bottom backstep level to a default value of -50 dB (B).

By further decreasing the level (make it more negative) the bottom detector will become more “sensitive”, and the bottom will be detected earlier.

Figure 40 The Bottom Backstep principle



On the echogram the white line will then “climb” up the slope. Make sure that you do not increase the sensitivity too much. This will have an effect on the fish detection on a flat bottom, and the biomass values will be wrong. Our experience show that an approximately -75 dB bottom backstep value can be used safely.

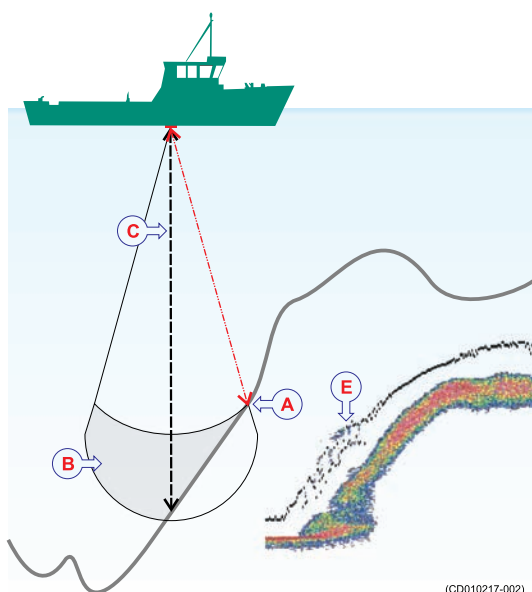
By increasing the bottom backstep value (make it more positive) the bottom will be detected later, and it will appear to be deeper.

Tip

Rule of thumb:

- Reduce the bottom backstep level (make it more negative) to detect the bottom earlier, and thus increase bottom detection “sensitivity”.
- Increase the bottom backstep level (make it more positive) to detect the bottom later, and thus increase “penetration”.

Figure 41 Bottom slopes



Example 13 Bottom slopes

The edge of the beam (A) hits the bottom first, and starts to give an echo. The bottom detector in the ES70 measures the strongest echo, detects what it thinks is the bottom, and starts the white line.

The area above the bottom detection (B) will be masked off, and even though it may contain fish these will not be visible because the echo from the bottom is stronger than those from the fish. The estimated depth (C) will be shown.

On the ES70 the phenomenon will cause the bottom line (E) to be distorted.

Example 14 Using the Bottom Backstep parameter for seagrass detection

If you use an Olex system, you can take advantage of the **Bottom Backstep** parameter to detect seagrass. Decrease the bottom backstep value (make it more negative) so that the bottom is detected at the top of an area of seagrass. The Olex will then detect the real bottom, and the result is the height of the seagrass.

→ *How to adjust the bottom detection to find seagrass* on page 92

Example 15 Using the Bottom Backstep parameter for flatfish detection

If you fish for sole, flounder or similar species, you can use the **Bottom Backstep** parameter to enhance the detection of the fish. Increase the bottom backstep value (make it more positive) so that the bottom is detected slightly deeper than the correct depth. The ES70 will then “push through” the fish better, and the flatfish will be shown as they are located “above” the bottom.

→ *How to adjust the bottom detection to find flatfish on page 91*

About range selection

For every frequency (channel) you wish to present on the echo sounder display, you are provided with two echograms.

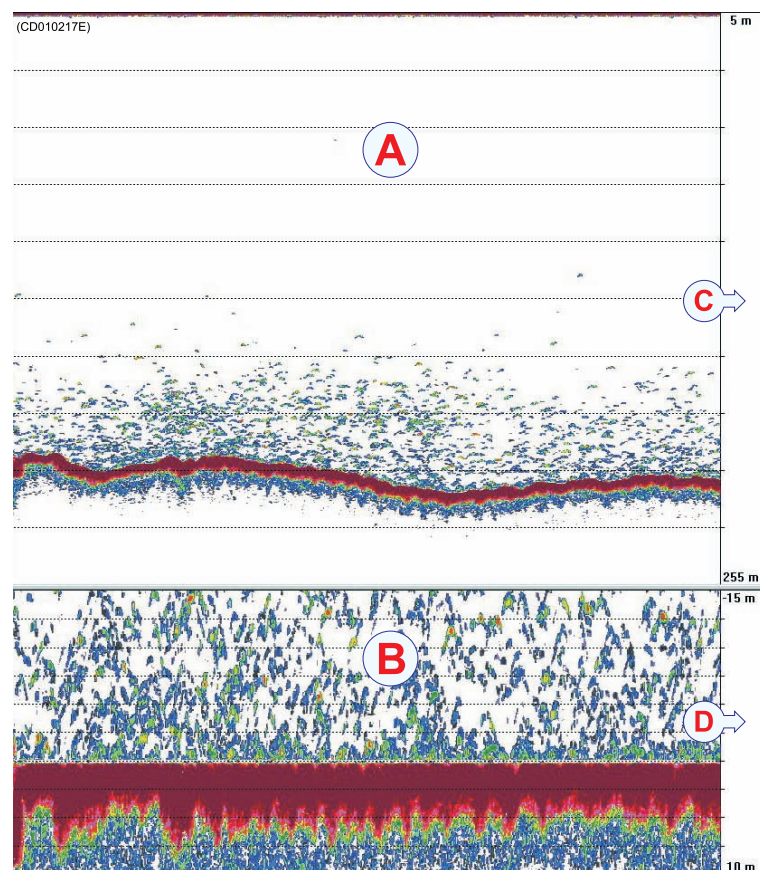
- A** Upper echogram (surface related)
- B** Lower echogram (bottom related)
- C** Scope view for upper echogram
- D** Scope view for lower echogram

Normally, the upper echogram will show the entire depth range from the sea surface and down to the bottom, while the lower echogram shows a bottom expansion. This is a magnification of the area just above and below the bottom.

You are free to choose any presentation you want in any of the echograms.

To do this, open the **Echogram** dialog on the **Active** menu.

Figure 42 Range selection



Upper echogram: Pelagic or surface related

When you need to establish a vertical depth range, why not let the echo sounder choose it for you. On the main menu, set **Range** to *Auto*.

You can also define your own depth range. To establish a depth range from the surface and down to the bottom, set **Range** to a suitable depth, and **Start Range** to 0 (zero) meters.

A *phased area* may also be established. This is used when you wish to concentrate on a certain and limited depth range. If you for example finds a school of fish 150 meters below the surface, you can set up the echo sounder to show this school without also provided information from the water column over and under it. To set this up, set **Start Range** to a few meters above the school, and **Range** to a few meters below it.

If you are bothered by interference from a sonar using the same operational frequency, try to set **Start Range** to 10 to 20 meters. You will then avoid the noise when both systems transmit simultaneously.

Example 16 Start Range in a surface related echogram

In a surface echogram, set the **Start Range** value to 0 meters. This will make the echogram start from the sea surface (provided that the transducer offset has been defined). Set **Range** to the current depth plus 20 meters. The echogram will now show the area from the sea surface and down to 20 meters “below” the bottom. The bottom contour is easily detected when the depth changes.

Example 17 Start Range in a surface echogram

In a surface echogram, set the **Start Range** value to 10 meters. This will make the echogram start from 10 meters below the sea surface (provided that the transducer offset has been defined). Set **Range** to the current depth plus 20 meters. The echogram will now show the area from 10 meters below the sea surface, and down to 10 meters “below” the bottom. The bottom contour is easily detected when the depth changes.

Example 18 Start Range in a pelagic echogram

In a pelagic echogram, set the **Start Range** value to 20 meters. This will make the echogram start from 20 meters below the sea surface (provided that the transducer offset has been defined). Set **Range** to 40 meters. The echogram will now show the area from 20 meters below the sea surface, and down to 60 meters below the transducer. Provided that the depth is larger than 60 meters, the bottom contour is not shown.

Lower echogram: Bottom related (bottom expansion)

The majority of our users prefer to use the lower echogram (B) for bottom expansion. This is the default setting.

When you use bottom expansion, the water surface is not the reference any longer, but the bottom is. It is always 0. That means that the bottom in this echogram will always be flat, even though it may vary in the upper echogram. To choose a vertical depth range for the bottom expansion, set **Range** to a positive value. This is the total vertical range of the echogram. Then, set **Start Range** to a negative value. This is the echogram's start height above the bottom. In this echogram positive depth is below the bottom, while negative depth is above.

Typical settings may be:

- Range = 15 m
- Start range = -10 m

This provides you with a 15 meters high phased area starting at 10 meters above the bottom to 5 meters below it.

Example 19 Start Range and Range in bottom related echogram

In a bottom echogram, set the **Start Range** value to -5 meters. This will make the echogram start from 5 meters above the bottom. Set **Range** to the 5 meters plus 10 = 15 meters. The echogram will now show the area from 5 meters above the depth, and down to 10 meters "below" the bottom. The bottom contour will appear as a flat line.

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